FROM: President Robert Robbins http://president.arizona.edu/
DATE: May 3, 2021

## ACCOMPLISHMENTS:

- As of one week ago, the University of Arizona POD has administered more than 185,000 doses of vaccine. Vaccine progress can be tracked on the COVID-19 dashboard.
- Over 6,000 students and 4,300 employees have uploaded their completed vaccination records to Campus Health.
- Registration continues to be open to all individuals age 16 and older at the University of Arizona POD. The University has utilized multiple outreach and incentive programs to increase student vaccination rates. The POD is now accepting walk-up appointments to meet community needs.
- Following our transition to Stage 3 instruction on March 29, the University's percent positive has consistently remained well below $1 \%$.
- In-person graduation ceremonies begin on Tuesday, May 11, 2021 and conclude on Tuesday, May 18, 2021. Graduates will receive individual recognition and be able to invite up to four guests to attend in person.
- We are excited Forbes named the University of Arizona as a Forbes Best Employer for Diversity. We ranked \#206 in the nation and \#2 in Arizona. Out of public universities, we ranked \#16 and out of all universities, \#23. Inclusion is one of our core values and continues to be an integral part of all of our work.


## GOALS:

- The Higher Learning Commission is conducting an on-campus visit in April 2021 as part of our accreditation process. I am grateful for the leadership of Dr. Gail Burd and the Office of the Provost, who have worked with partners across the university to prepare for the review, and I look forward to a successful visit.
- As I recently announced, the university is excited to return most courses at our Main Campus to fully in-person formats in the fall, with some courses offered as flex inperson as public safety requires. All in-person classrooms will adhere to CDC guidelines. We will continue to offer select Live Online and iCourse options for those students who are not yet comfortable returning to in-person classes.
- Also recently announced, after the spring semester is over, starting May 17, 2021, units that are not already engaged in on-campus work may begin to transition back if they are able to meet the University's safety protocols. Units are encouraged to gradually increase in-person activity and supervisors are asked to be as accommodating as possible in response to requests for flexibility, with the understanding that some jobs are unable to be performed remotely. I look forward to seeing many of you in person once again in the near future.
- I know that this has been a unique and challenging year. I wish everyone a successful end to the semester and hope that you all have the opportunity to rest and rejuvenate over the summer.


## REPORT TO FACULTY SENATE

## FROM: Senior Vice President for Academic Affairs and Provost Liesl Folks https://provost.arizona.edu

DATE: 3 May 2021

## ACCOMPLISHMENTS and GOALS

- HLC Campus Visit for Reaccreditation
- Senior Vice Provost Prof. Gail Burd and her team led the campus through the seamlessly organized HLC site visit by the accreditation committee, during 26-29 April 2021, involving dozens key stakeholders in meetings to review all aspects of our operations. Thanks to the great many faculty, staff and students from across campus who contributed their time and wisdom in articulating their understanding of the institution during this mostly virtual process, which is critical for our continued success. It will be a few weeks before we see the draft report and likely a few months for the Board of Trustees to sent the final letter.
- Campus Updates:
- Memo on Career-Track Title Harmonization sent to faculty, department heads and deans April 15.
- Memo on D2L Global Announcement Regarding Vaccines sent to all faculty, instructors, and department heads on April 19.
- Memo on Guidance on Return to In-Person Work sent to all employees on April 21.
- Memo on Covid-19 Faculty and Instructor Survey - Spring 2021 sent to faculty and instructors on April 22.
- Academic Update Memo sent to faculty, staff and DCC's on April 23.
- Live Chat session topics with faculty and instructors:
- April 6, 2021 - Mental Health and Wellness Resources for Faculty, Staff and Students.
- May 18, 2021 - Last LCWL Session until the Fall - "Looking Ahead - What's Coming in AY21/22."
- Link to register or watch recorded sessions: https://provost.arizona.edu/content/provostforum.
- Other updates:
- Career Track Faculty Harmonization: Developing processes for transition to new titles with the goal to complete process for Fall 2021, to allow pay equity review to proceed.
- Course Support for Caregiving Instructors: As of April 30, 2021, we have awarded \$338,537 to instructors in 14 colleges for supports for grading, online content development, online teaching, and technology costs.
- Provost's Innovation Fund: Surveys intended to inform improvements to the PIF application and review process were sent to past applicants, reviewers, faculty, and staff.
- Strategic Priorities Faculty Initiative (SPFI): Awarded \$992,325 over period of 3 years in SPFI funding for diverse faculty hires starting in the fall (in addition to ongoing support for hires in recent years).
- Academic Instruction Guidance for Summer 2021 and Fall 2021: Working with PAC to put together guidelines and updates, including for attendance policy, summer programs / camps, experiential learning, and field trips.

DATE: May 3, 2021
SUBMITTED BY The Faculty Officers, Jessica Summers, Chair of the Faculty; Melanie Hingle, Vice Chair of the Faculty; Michael Brewer, Secretary of the Faculty http://facultygovernance.arizona.edu/

## ACCOMPLISHMENTS

- Faculty Elections Updates
- The Committee on Elections, UITS, Faculty Center Staff and Faculty Officers met to formalize a protocol for Faculty Voting. This protocol was been implemented with the March run-off election and is available here:
https://facultygovernance.arizona.edu/faculty-elections-protocol.
- Other elections-related changes that have been implemented include automatic release of tabulation data for all Senate elections and the structure for a report on elections that characterizes the voting body for each of the elections in the past few years and will form the basis for annual reports released hereafter. Please see:
https://facultygovernance.arizona.edu/participate/elections/elections-historical-data-reports.
- Ongoing debate about paper ballots have not been satisfactorily resolved and will be discussed at Senate.
- Census of the General Faculty Updates
- https://facultygovernance.arizona.edu/participate/elections/census-generalfaculty
- We worked with colleagues at UAIR (thank you!) to make the full Census of the General Faculty is now available to anyone with a NetID (though one must be on campus or use VPN to access it, as it is housed in UAccess Analytics) including name, title, and vote code/college.
- A description of how the census is generated using the criteria for membership in the General Faculty (Faculty Constitution, Article II) and data from UAccess Employee is now also available.
- A Qualtrics tool has been built to help those who do not find themselves on the census, but believe the criteria apply to them, to petition the Committee on Faculty Membership for inclusion. This tool pulls data from UAccess and also prompts petitioners to provide the information necessary for the committee to make a determination. While the census report run in UAccess Analytics captures upwards of $99 \%$ of those who should be in the General Faculty, there are some rare instances where it misses individuals (primarily CT faculty with
additional administrative or other appointments). This new petition tool gives those people an easy way to resolve their cases.
- The Shared Governance Review Committee was convened for the $5^{\text {th }}$ and final time this academic year on Monday, April 19 ${ }^{\text {th }}$; members discussed revisions to the signed Shared Governance Memorandum of Understanding and a future "implementation plan" to guide participants in operationalization of SG principles. Work will continue on these documents by all group members. Please see the Annual Report for details.
- Worked with the Provost, Vice Provost for Faculty Affairs, the Senate Ad Hoc Committee on Career Track Faculty, and others to move forward proposed changes to clarify titling for career track faculty. Relevant policy changes will come to Senate prior to approval and implementation.
- Ongoing discussions with Office of Gen Ed, UWGEC, UGC, and Provost's Office regarding (Senate) faculty input to Gen Ed Refresh, and related program approval process.
- A Special Senate meeting was convened on Monday, April 26, 2021 to discuss proposed changes to the constitution \& bylaws, and how we want to conduct ourselves as a body. Please see the UA Office of the General Counsel memo regarding Arizona Open Meeting Law and University of Arizona Organizations, posted to the Faculty Senate 4/26 agenda, and to the Senate FAQs.


## GOALS

## SHORT-TERM:

- Review the statement on Justice, Equity, and Inclusion from the Association of Governing Boards of Universities and Colleges (AGB) to promote discussions with UArizona senior leadership and the Board of Regents on this important topic.
- Work with administration on streamlining the program approval process while ensuring for adequate engagement from faculty shared governance entities, including Senate. Goal date: next discussion scheduled for May 10, 2021.
- Work with members of the Shared Governance Review Committee, Faculty Senate, President Robbins, Provost Folks, Secretary Dudas, SVPR Cantwell, \& CFO Rulney to establish guiding principles and an implementation plan describing how we will collaborate on decisions and direction of the university.
- Revise the membership and mechanisms for populating the Undergraduate and Graduate Councils to include ex officio representation from Senate and to ensure Councils have representative faculty membership and adhere to the Shared Governance Memorandum of Understanding.
- Ensure appropriate continued faculty representation on UWGEC and UGC given planned changes to Gen Ed.
- Work with members of Senate to populate Senate standing Committees for AY21-22.

LONG-TERM:

- To ensure a continued successful, safe, and healthy return to campus life for all members of the UA community. ***MARK YOUR CALENDARS for AY2122 Senate meetings: The Faculty Senate will reconvene in person on Monday, September 13, 2021.***
- To broaden participation in shared governance to ensure that the University lives up to its values and supports its mission as we move ahead.
- To work with you to do all that we, as a community, can do to save lives, support our most vulnerable community members, and increase faculty participation in all decisionmaking that affects our lives and the long-term health and well-being of all of us.

Thank you to all of our outgoing Senators for your service -Senators Acosta, Castro, Colina, Dong, Ghosh, Hassan, Hildebrand, Hiller, Kaufman, Min Simpkins, Oxnam, Provencher, Roussas, Ruggill, Singleton, Spece, Sulkowski, R. Witte.

Welcome to all the incoming Senators - we look forward to meeting you. There will be a new Senator orientation in August.

To Our Senate Colleagues: We remain grateful to you for your hard work, your input, your ideas and your continued engagement in shared governance. We continue to work to support the work of the University and to ensure the prominence of the Faculty voice.

Contact us: email (Jessica Summers, jsummers@arizona.edu, Melanie Hingle hinglem@arizona.edu, Michael Brewer mbrewer@arizona.edu)

[^0]Former President: Tara Singleton

Student Body President: Noah Vega
Hello everyone!
Thank you all for your work and efforts on faculty senate and other shared governance bodies this year. It has been great to work alongside you all and learn with you. This year has been challenging for all of our constituency groups, so I appreciate your efforts to keep students at the forefront.

As you know, the student body president changes every year, but student advocacy efforts remain similar. Getting to be a voice for students has been the highlight of my presidency, especially when the student experience has changed so drastically. I hope that asking for the student's opinion in a genuine way continues, as I think it has greatly improved our ability to advocate this year.

Noah, our new student body president will now take over this role. I know that he will be an essential part of continuing the work that ASUA has done both over my time here and before. Our entire new class of elected officials are eager and excited to be in these positions and truly exemplify the power of student advocacy.

After 4 years at UA and in ASUA, 3 majors and so many great involvements, I will be graduating Summa Cum Laude with a B.A. in PPEL, Philosophy \& French. Upon graduation I will (pandemic willing) be headed to the University of Glasgow in Scotland, to pursue a Master's in Human Rights and International Politics. I am so excited for this opportunity, and would not have been able to accomplish this without my time at $U$ of $A$. Thank you again for this year! If you need anything don't hesitate to reach out (taransingleton@email.arizona.edu) Good luck Noah!

Bear Down,
Tara Singleton

ASUA Student Body President 2020-2021

# Developments with University of Arizona Global Campus (UAGC) In Spring 2021 

Submitted to Faculty Senate, May 2021<br>Global Campus Senate Advisory Committee

In the Spring 2021 Semester, in addition to individually consulting with faculty, program directors, heads, and in some cases deans in our respective colleges, Global Campus Senate Advisory Committee members Hudson, Rhoades, Bourget, DiRoberto, Michas, Milbauer, Nadel, and Stephan met with directors of three programs in three academic colleges with considerable overlap with UAGC offerings to conduct a preliminary assessment of how the new arrangement was working. The three were: Jeff Schatzberg of the Dhaliwal-Reidy School of Accountancy in the Eller College of Management, Lee Ryan, head of the Department of Psychology in the College of Science and Sheena Brown, director of Human Services Program in CAST. We also met as a committee with Vice Provost Craig Wilson, head of Arizona Online, after having also met with him in the Fall 2020 semester.

## Meaningful Shared Governance

As emphasized in our December 2020 report, "meaningful shared governance depends on shared governance entities (i.e., the Faculty Senate and this committee) receiving timely and sufficient information from central administration to engage in substantive deliberation before decisions are taken, rather than simply being informed on policies or decisions after they have been implemented." We reiterate that point here, and amplify it by emphasizing the need for timely communication and deliberation about substantive matters between the senior leadership team (SLT) of University of Arizona, the faculty, program directors, and deans of the university as well as its shared governance bodies.

Up to this point, too many players who are key to making the arrangement between the University of Arizona (especially Arizona Online), University of Arizona Global Campus, and Zovio work are being left out of deliberations, planning, and implementation of key aspects of the articulation. This is not a matter of people in the University of Arizona wanting to block or oppose the arrangement; it is about allowing colleagues who have a direct stake in these matters to engage and to help optimize the situation for students, programs, faculty, and staff at both the University of Arizona and UAGC.

Moreover, the senior leadership team has been suggesting the idea, in several settings, of "assimilating" UAGC into the University of Arizona. We believe such a move should be the product of considered and extensive deliberation and subject to the policy of the shared governance bodies of the University of Arizona. We particularly believe that the prudent path is to analyze how UAGC is currently affecting University of Arizona programs, and we recommend assessing how UAGC's historical academic, ethical, and financial practices have improved before considering assimilation. We also think it is prudent to assess the financial health of UAGC before assimilation, particularly given that similar ventures have not had positive outcomes. For example, the most recent financial reports for Purdue Global suggest that three years after its formation, it is still losing revenues. We note as well that UAGC has still not received not-for-profit status from the Internal Revenue Service, and thus may still be a for-profit entity as of this report.

## Follow through to our December 2020 report

Within Arizona Online, it is clear that there are some important steps that build on principles of our December 2020 report. Two key steps relate to marketing.

First, we applaud Vice Provost Wilson for forming teams within the University of Arizona to address marketing of Arizona Online programs, teams that in some cases include people from units with programs that overlap with UAGC's offerings. That is an important step in following through on our December report's recommendations (see Quality Principle 4). We recommend developing the inclusion of program directors and faculty from the academic units directly in marketing deliberations and planning.

Second, we applaud Vice Provost Wilson for working with UAGC staff to address marketing/recruiting concerns related to students' confusion about the differences between Arizona Online and UAGC. Again, this is a step in the right direction, beginning to address our December report's recommendations (see, for example, Quality Principles $1 \& 4$ ). We still have serious concerns, however, that prospective students may often be unclear about the difference between the two institutions and programs, believing that UAGC is simply another University of Arizona unit, no different from the rest of the University of Arizona. We recommend more strenuous, systematic follow-up on these matters, as suggested in our December 2020 report.

It is also clear, however, that the SLT has not acted on the recommendations of the December 2020 report, though at the time they seemed receptive to at least some of the recommendations. It is telling that the Joint Academic Advisory Committee-which several administrators have spoken about in the Fall as being forthcoming-is still "in process." (We nominated a former GCSAC committee member, Mike Staten, Associate Dean, CALS to be on that committee.) Even more telling is the fact that who will be on that committee is not clear to people integral to the situation, even at the level of deans. We also note that in our December 2020 report, we suggested that the JAAC would not be able to address the range of issues that this situation poses, which warrant serious, systematic attention.

Further, it is evident that little progress has been made with regard to the Governance and the Finance and Growth Plans principles and recommendations that were made in the December 2020 report. Neither faculty shared governance bodies nor most college deans are involved. We encourage all players to address the important strategic and synergistic issues surrounding Arizona Online and UAGC now, as recommended in our initial report.

As one final point, we note that when we expressed interest in the fall in meeting with theninterim President Paul Pastorek, Provost Folks discouraged a meeting with him, saying that he was only a temporary president concerned with overseeing the mechanics of the deal. We have since learned that he was reinstated as president of UAGC on February 9, 2021.

We have organized our follow-up report into four themes that consistently emerged in our meetings and conversations. And we emphasize again, our meetings were with program directors very much committed to making this relationship work in a "win-win" way for the University of Arizona and with UAGC. These are people who have invested enormous time in building quality Arizona Online programs and who are also deeply invested in students being optimally served by both entities. All felt largely left in the dark about a range of key policies and developments central to their own unit planning and strategy. In reporting this, we also want to
emphasize that all spoke well of their experiences with Arizona Online generally and were keenly interested in contributing productively to decision making at more senior levels of administration by providing insight, context, experience and relevant data.

## Lack of Communication

The program directors we talked with were concerned about a lack of communication from the SLT about the new arrangement, especially its long-term strategy and goals and its day-to-day operations. Inquiries about meetings with UAGC counterparts were met with evasion, deflection and a lack of information, contradictory statements from the Provost's office, and disconcerting advice not to worry. Again, the formation of the Joint Academic Advisory Committee (JAAC) was held out as a forthcoming solution to the information and decision-making vacuum. But these program directors were largely in the dark about matters critical to their program operation, development, and growth in ways that will serve University of Arizona students, faculty/staff, and programs. It is obviously early days yet in the relationship between Arizona Online and UAGC, but this dearth of communication is deeply problematic, and is anything but a recipe for success.

## Insular Decision Making

The lack of clear communication about matters important to the programs highlighted the problem of opaque decision making about articulation and coordination of competing programs, and even program development regardless of the UAGC competition. Our interviewees expressed in no uncertain terms their desire to collaborate productively for "win-win" solutions. Each was happy to talk with our committee, reporting that no one else associated with the UAGC articulation had contacted them or demonstrated any sustained interest in their perspectives or concerns. It became clear that program directors, department heads, and even most of the deans they report to and the Vice Provost of Arizona Online are out of the loop on coordination between University of Arizona and UAGC. The insularity of whatever decision making is taking place is hampering, even compromising the ability of people at the college and program level to do the sort of planning, program development, and accreditation work that is so fundamentally important to quality programs.

## Confusion About Marketing

We acknowledge again the work of Vice Provost Wilson to address some marketing issues. But each program director was acutely worried about confusion in marketing caused by the use of the University of Arizona name and "block A mark" on UAGC's webpages. They are not afraid of competition, and indeed are used to it. The challenge is competing with "ourselves" (that is, with UAGC, which is perceived by many students and recruits to also be part of University of Arizona). In some cases, that was leading program directors to engage time and money in intensive counter-marketing. But all were concerned about the extensive resources and sometimes misleading marketing messages of UAGC/Zovio. Again, we acknowledge Vice Provost Wilson's efforts to address some of this through a common shared one-page sheet for advisors at UAGC and the University of Arizona to answer certain questions about differential routing for prospective students. But we note again, the need for the sort of oversight we called for in our report. We also note the need for at least some of the monies from the Ashford/UAGC/Zovio deal to go to marketing for Arizona Online and academic units with
overlapping programs. But, we emphasize, this is about more than just supplementing program marketing resources. Quality University of Arizona programs that have won trust, acclaim, high rankings and special accreditations are in danger of being critically undermined by UAGC's infrastructure of recruiters, advisors, and marketing resources (estimated to be at least ten times those of Arizona Online) and in the deploying of the University of Arizona brand in the service of a rival institution and rival programs notably lacking our programs' quality assurances.

Moreover, each of the program directors spoke to quality concerns for UAGC students in regard to particular programs and future employment. The time they had invested in quality Arizona Online programs that effectively prepare, graduate, and place graduates translated into genuine concerns about UAGC students. We believe, as our 2020 report emphasized, that the SLT needs to work in concerted, collaborative, and meaningful ways with academic colleges, departments, programs, and faculty to address these quality concern issues. And we believe as well that any strategic plan for Arizona Online should address its Vice Provost's clear understanding of the need for fuller infrastructure to support measured growth. We see no evidence of such planning by the SLT.

## Any Consideration of Assimilating the Two Institutions Should be the Product of Extensive Shared Governance and Financial Analysis

We have heard from various sources of the idea being floated by the President that UAGC may be "assimilated" into the University of Arizona at some point in the future. We have heard no one speak positively about this prospect. While assimilation might ultimately, but not necessarily, benefit many UAGC students, we fear that it would undermine University of Arizona programs, degrees and the students we educate. The opposition of many faculty and administrators is clear. And it is understandable given that the pitch of this arrangement throughout has been that UAGC will be a separate institution with no impact on the University of Arizona. It seems clear such a decision may be in the works. It seems even more clear that it is premature, and that the prudent course would be to analyze over a period of several years the financial and academic viability of UAGC before considering any path to assimilation. We strongly encourage the Faculty Senate to actively take up this issue and possibility as a top priority for 2021-2022.

FROM: Jennifer Lawrence, APAC http://apac.arizona.edu/
DATE: May 3, 2021
ACCOMPLISHMENTS:

- The Appointed Professionals Advisory Council and Classified Staff Council voted in March to merge into one organization, UArizona Staff Council, that will represent all University Staff and Classified Staff.
- Worked with Academic Technologies to build UArizona Staff Council presence in Marketing Cloud as a way of communicating with our constituency. Ongoing effort.

GOALS:

- Hold elections to fill officer positions in UArizona Staff Council (late May)
- Solidify agreements for representation, support and participation with other shared governance entities and the administration (through summer)

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## APPC Annual Report 2020-2021

## 2019-2020 APPC Members:

Tessa Dysart, Co-Chair, LAW (6/18-5/21)
Ronald Hammer, Co-Chair, COM (6/16-5/21)
Khadijeh Alnajjar, Post Doc (6/20-5/21)
Jennifer Beyer, GPSC (6/20-5/21)
Janet Cooley, COP (6/19-5/21)
Daniel B. Ferguson, RDI (1/19-5/21)
Martin Reimann, ELLER (6/20-5/21)
Judd Ruggill, COH (6/18-5/21)
John P. (Pat) Willerton, SBS (6/10-5/21)
APPC met 6 times during the 2020-21 year ( $9 / 17,10 / 15,12 / 10,1 / 12,2 / 11,3 / 25$ ) to review issues \& policies summarized below. We may also meet in April if needed.

### 9.17.2020 Meeting

Guests: Mary Beth Tucker, Interim Associate Vice President, Equity and Title IX Coordinator Ilya Smith, Chief Compliance Officer, Chief Privacy Officer; Danielle Oxnam, Executive Assistant, Office of University Initiatives
Summary: Tucker updated the committee on extensive new regulations connected to Title IX that were released in May 2020. She provided an overview of Title IX and added it has never had extensive regulations until then-Secretary of Education, Betsy DeVos published the current regulations. Committee members asked questions. Smith informed the committee the Interim Public Health and Safety Policy was effective as of September 1, 2020, but was in a 30 -day stakeholder feedback period that could change the policy. Committee members asked questions and posed concerns.

### 10.15.20 Meeting

Guest: Andrea Romero, Vice Provost, Faculty Affairs
Summary: Romero introduced proposed revisions to the annual performance review process and provided background information regarding how these proposed changes came about. She added the proposed changes were still in draft form and APPC was the first group outside of OGC to see the changes and provide feedback. Romero said the goal of the proposed changes was to reduce burdens on faculty, department heads, and directors while increasing the meaningfulness of post-tenure reviews for award nominations and feedback on promotion to Full Professor. Committee members asked questions and posed concerns.

### 12.10.20 Meeting

Summary: Hammer provided information regarding changes to the revised UHAP APR language since the last APPC meeting including simplifications to the peer review process. Committee members posed additional questions and concerns.

### 1.12.21 Meeting

Guest: Michael Brewer, Senior Information Resources Officer
Summary: Brewer discussed policy changes, proposed by UITS, regarding email services for emeritus faculty, employees who leave the University, are terminated, retire, or are no longer DCCs. The proposed changes would also apply to staff. Brewer said the causes of the proposed policy change came from constraints on the number of seats for software, including the Microsoft 365 office suite. He added UITS had looked into the percentage of employees who retire and continue to use their UA email and found roughly $80 \%$ stopped using their email. Brewer added UA email could become an opt-in service instead of granting access automatically after separation from the University. Committee members asked questions.

### 2.11.21 Meeting

Guests: Kasi Kiehlbaugh, Senior VP Health Sciences
William Neumann, Professor of Practice (Career Track), Eller College of Management
Summary: Neumann provided an overview of ongoing work that related to career track faculty titles. He stated this item would reach the Provost as a recommendation and would be shared at an upcoming Faculty Senate meeting. He also provided details of the career tract faculty ad hoc committee's makeup. Neumann stated the motivation behind improvements to career track faculty titles was the need to explain the structure of career track faculty. There were over 235 titles for career track faculty and UAIR was asked to put titles into buckets. Information was collected on inconsistencies and/or career advancement based on titled. A salary equity study was completed last year for tenure and tenure track faculty and the Provost was interested in conducting a similar study for career track faculty. Committee members asked questions and posed concerns. Hammer also discussed the latest iteration of revision to APR and committee members continued to ask questions and pose concerns.

### 3.25.21 Meeting

Guest: Lucas Schalewski, Director, Assessment - Research
Summary: Schalewski asked the committee for feedback on survey guidelines and processes previously distributed to members. He stated the guidelines and processes document was created because there had not been a coordinated, transparent process for surveying the UArizona campus community. He added there was need for ethical practices associated with surveying the campus to ensure employee and student privacy. The guidelines and processes presented by Schalewski were also geared toward removing survey fatigue, especially found within over-surveyed vulnerable populations on campus. Committee members asked questions and suggested that this item ultimately go to Senate.


Tessa L. Dysart, Co-Chair, APPC

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Dr. Javier Duran, Chair, Latin American Studies (6/15-5/21)
Dr. Sonia Colina, Vice Chair, Spanish \& Portuguese (6/18-5/22)
Dr Carine Bourget, French \& Italian (6/19-5/21)
Dr. Evangeline Dowling, Nursing (6/20-5/22)
Dr. Aileen Feng, French \& Italian (6/19-5/21)
Dr. Wolfgang Fink, Electrical \& Computer Engineering (6/18-5/22)
Ms. Maryan Hassan, ASUA (6/20-5/21)
Dr. Laura Hollengreen, School of Architecture (6/19-5/21)
Mr. Adam Roussas, GPSC, (6/20-5/21)
Dr. Karen Seat, SILLC (6/19-5/21)
Dr. Caleb Simmons, Religious Studies and Classics (6/2-5/22)
Dr. Jessica Summers, Teaching/Learning/Sociocultural Studies (6/18-5/22)
Dr. Marlys Witte, Surgery (6/20-5/22)

The committee was established in 1947 by President James Byron McCormick to obtain advice from the faculty. When the Faculty Senate and Constitution were established in 1948, the Committee of Eleven was defined constitutionally and membership determined by faculty-wide election. It is unique in higher education governance structures and is independent of other faculty or administrative committees or organizations. The Committee of Eleven is Universitywide and does not have a prescribed agenda.

Faculty Constitution Article V, Section 3 provides:
The Committee of Eleven shall:
a. Initiate, promote, and stimulate study and action dealing with and looking toward solution of situations and problems of interest and concern to the faculty and to the University.
b. Make reports to the General Faculty or the Faculty Senate.
c. Speak for the General Faculty as and when authorized by the General Faculty.

The 2020-2021 Academic Year was extremely busy for the Committee of Eleven, due to the Covid crisis and the resulting complexities and challenges. Given the uncertain and constantly changing public health situation at the end of the Spring 2020 term, the committee continued to meet regularly over the summer.

Among the Covid-related topics discussed with committee members and guests were faculty and staff reaction to the University's Covid response, institutional budget challenges, reentry plans for fall 2020 and spring 2021, and the university-wide furlough program.

The most significant project undertaken this year by C11, in terms of effort and time, was the Leadership and Communications survey. C11 created the survey, analyzed the results, drafted qualitative and quantitative reports, and organized a townhall to discuss results and facilitate a conversation between the Senior Leadership Team (SLT) and faculty, staff, and graduate students. While the SLT declined the invitation to attend, about 270 faculty, staff and graduate students participated in the townhall.

In addition to the survey and covid-related topics, the Committee of Eleven's focus during 20202021 included challenges to the university campus pantry, UAPD review, the challenges faced by shared governance, and the Ashford University acquisition. Several statements were issued regarding these and other matters (for more details, please consult the pertinent documents in the C11 web page).

It is customary for C 11 to invite guests to its regular meetings to engage in discussion of pertinent issues with committee members. During the 2020-2021 academic year the list of guests included:

Coalition for Academic Justice at the University of Arizona (CAJUA), Steering Committee Members ( 3 meetings, including one with guest Joerg Tiede, Senior Program Officer and Researcher, American Association of University Professors (AAUP)

President Robert Robbins and Jon Dudas, Secretary of the University
Provost Liesl Folks
Lisa Rulney, Chief Financial Officer
Brent White, VP for Global Affairs
Helena Rodrigues, Vice President, Chief Human Resources Officer
UA Caregivers Group: Leah Fabiano-Smith, Nicole Iroz-Elardo, Alison Meadow, Sarah LeRoy

Taren Ellis Langford, Director, Conflict of Interest
Finally, the committee's Chair and Vice-Chair met with individuals and small groups that expressed specific concerns under the purview of C11. Chair and Vice-Chair advised said individuals and groups and brought matters back to the committee when warranted.

It is our hope that in 2021-22 the committee, including new and continuing members, will continue its this work guided by its usual enthusiasm and dedication to faculty issues.

Respectfully submitted,
Javier Duran
Chair, Committee of 11

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# THE UNIVERSITY OF ARIZONA <br> Committee on Academic Freedom and Tenure 

Annual Report 2020-2021

## Committee Members

Dr. Dalila Ayoun, Chair
Dr. Diane Li, Vice Chair
Dr. Michael Brescia
Dr. Nolan Cabrera
Dr. Jamie Edgin
Ms. Yamila El-Khayat
Dr. Lynn Gerald
Ms. Yvonne Mery
Dr. Janet Meiling Roveda
Dr. S. Mae Smith
Dr. Lynda Zwinger

## Mission Statement

| French and Italian | COH |
| :--- | :--- |
| East Asian Studies | COH |
| Arizona State Museum | CC |
| Educational Policy | COE |
| Psychology | COS |
| AZ Health Sciences Library | LIB |
| Clinical/Health Outcome Sci | COPH |
| Main Library | LIB |
| Electrical Computer Engineering | ENGR |
| Disability/Psych Studies | COE |
| English | SBS |

The Committee on Academic Freedom and Tenure shall have jurisdiction to make inquiry and to conduct hearings in two general areas contained in ABOR 6-201 and 6301, namely: in regard to those matters contained in the Conditions of Service dealing with the contractual employment relationship between the General Faculty member and the University /Board of Regents; and in regard to any internal matters relating to grievances against or by any member of the General Faculty. The committee shall consider the protection of academic freedom and tenure as a principal obligation. (Certain preliminary steps for dismissal situations are described in Chapters 3 and 4 of the University Handbook for Appointed Personnel and Sections 6-201 and 6-301 of the University Handbook for Appointed Personnel and Sections 6-201 and 6-301 of the Arizona Board of Regents Policy Manual.)

## Hearings

CAFT did not hold any hearings in 2020-2021.

The Chair is grateful for the expertise and dedication of CAFT members, all of whom volunteer their time for service on this important faculty rights committee.

Respectfully submitted,
Dalila Ayoun
Chair, CAFT (2019-2021)

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Committee on Conciliation ANNUAL REPORT 2020-21

Committee Members
Dr. John Milbauer, Chair
Dr. Dawn Coletta, Vice-Chair
Dr. Joyce Schroeder
Dr. Jeffrey Fehmi
Dr. Benjamin Lawrance
Dr. Barbara Selznick

Department
Music
Medicine
Mol/Cellular Biology
Natural Resources
History
Theatre, Film, and TV COFA

College
COFA
COM
COS
CALS SBS

## Term

2019-2021
2019-2021
2019-2021
2020-2022
2020-2022
2020-2022

Two grievances were forwarded to the Committee on Conciliation from the Grievance Clearinghouse Committee:

1. Overview. Grievance filed by a faculty member against a department head for suppression of academic freedom. The grievance stemmed from disagreement about what constituted academic freedom at UA, in particular regarding a faculty member's right to question publicly the decisions of a head.

Outcome: Partial success. Respondent refused initial desired outcomes but expressed openness to considering incorporating aspects of them into the work of the department.
2. Overview. Joint grievance filed against a department head for suppression of academic freedom, issuance of Letters of Concern, and threat of termination of employment. As in the prior conciliation from 2020, grievants again cited the UA's embrace of the University of Chicago's "Report of the Committee on Freedom of Expression"-a document approved by UA Faculty Senate in December, 2018 and endorsed by President Robbins in March, 2019, guaranteeing the right of faculty to question the decisions of supervisors.

Outcome: After meeting with the conciliators and prior to scheduling a final meeting with both grievants and respondent, the respondent withdrew from the process. Conciliation was not successful.

The Chair of CoC was asked in April 2021 to meet with Vice Provost for Faculty Affairs Andrea Romero and will meet with the Academic Personnel Policy Committee in May 2021 to discuss revision of CoC guiding documents. The CoC Chair will suggest at that meeting that a wider dissemination of the "Chicago Statement on Freedom of Expression"-especially among supervisors, heads, and chairswould be wise, as both grievances addressed in 2020-21 by CoC arose from disagreement about academic freedom and freedom of expression. The following excerpt is relevant: "Concerns about civility and mutual respect can never be used as a justification for closing off discussion of ideas, however offensive or disagreeable those ideas may be to some members of our community."
https://facultygovernance.arizona.edu/sites/default/files/appc_freedom_of_expression_dec2018.pdf
Respectfully Submitted,
Dr. John Milbauer, Chair
Committee on Conciliation

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# Constitution and Bylaws Committee 

## 2020-2021 Annual Report

## Members:

Mr. Michael Brewer, CHAIR, Secretary of the Faculty
Dr. Amy Fountain, SBS
Dr. Alex Braithwaite, SBS
Dr. Javier Duran, COH
Ms. Cheryl Cuillier, LIBR
Dr. Andrea Romero, ex-officio/non-voting

Our committee handled business over email throughout the year. We reviewed and proposed changes to the Constitution and Bylaws that included a number of housekeeping and substantive changes, including making both the Constitution and Bylaws free of gendered pronouns, providing a mechanism for Senate to call a meeting of the General Faculty, and adding Senate representation to the Undergraduate Council, Graduate Council, and University-wide General Education Committee, among others.

Respectfully submitted


Michael Brewer
Chair
Constitution and Bylaws Committee

Diversity, Equity \& Inclusion Committee

## DEI FAC SEN Annual Report 2020-2021

## 2020-2021 DEI Members:

Stephanie Troutman Robbins, Chair, SBS
Rebecca Tsosie, LAW
Abraham (Bram) Acosta, Co-Chair, COH
Melanie Hingle, CALS
Rachel Castro, LIBR
Max Strassfeld, COH
Cameron Rua-Smith, ASUA
Kayla Beard, GPSC
Leila Hudson, SBS
Margarita Acedo, Postdoc
Aditya Adiredja, COS
The newly established Diversity, Equity \& Inclusion Committee of the Faculty Senate (DEI Fac Sen) met 8 times during the 2020-21 year ( $8 / 21,10 / 27,11 / 10,11 / 24,3 / 9,3 / 23,4 / 6,5 / 4$ ) to review issues as summarized below.

### 8.21.20 Meeting

Activities: Discussion of Ashford acquisition in relation to larger DEI goals and initiatives; discussion of development of (possible) MOU for accountability purposes w/ regard to DEI-related issues impacting leadership, values, and multiple UA populations (students, faculty, etc.)
Summary: The committee discussed making recommendations to Faculty Senate with communication moving forward on diversity goals. A statement on the Ashford acquisition will be forthcoming from the committee and circulated to the Faculty Senate. The committee would like to be included with any decision on equity and diversity. Although the University has a five-year plan to make improvements for non-traditional students, a committee member would like to see benchmarks and specific ways to improve students' experiences. A committee member agreed and stated that the only plan she has heard mentioned is a "Champs" plan, which is a peer-to-peer support network. A committee member said a new ad hoc committee will be appointed to specifically look into the Ashford acquisition, and this committee can connect with that group. Committee members discussed strategies for speaking at Faculty Senate, as well as having a means for the campus community to submit questions or concerns via email. A direct email address for the committee will be investigated. Committee members discussed faculty diversity and whether or not the Provost's Office maintains data on this topic, as well as if there was a replacement for the former head of the Diversity Office, and if a flowchart would be helpful to show how diversity entities on campus are connected.

### 10.27.20 Meeting

Activities: Committee continued discussed clarification of roles; greeted new member/first-time attendee—Rua Smith, ASUA rep. Conducted closed meeting (Executive Session) with guest, Milbauer. Committee discussed DEI statements, hires/hiring process, and potentially inviting Ivy Banks.
Guests: John Milbauer
Summary: Committee discussed next steps relating to Guest Milbauer's topic. Follow up and preparation for Ivy Banks joining meeting. Continued conversation regarding (diverse) hires, UA executive administrative team's responses to DEI concerns happening nationally and locally/on campus. Chair Troutman Robbins expressed the need for support with administration tasks for the committee. The needs being: Senate reports, agenda approval, minute edits. Chair Troutman Robbins asked for emails to be sent to her and cc Co-Chair Acosta regarding delegation of these tasks. Co-Chair Acosta will complete the Senate reports. Member Tsosie volunteered to help with minute edits. Another committee member volunteered to help with extra tasks.

### 11.10.20 Meeting

Activities: Plan for upcoming meeting w/ Ivy Banks. Larger discussion around how to bring better focus to core work of committee in relation to Faculty Senate. Some focused discussion on faculty equity issues, including service, UA Vitae, other accountability mechanisms and governance structures. The committee planned priorities for output.
Summary: A committee member brought up three main points with regards to Guest Banks. The fact that the committee does not know Guest Banks or what her agenda is means part of the work is getting to know her and figuring out how her priorities align with the committee. Another part of the work is protecting Guest Banks with regards to job security if administration does not feel she is doing the job effectively. Can the committee show the work she has done with them to help support her? The last point is that the DEl is not a group that Guest Banks will answer to; rather it should be a resource to collaborate with to make real change. A committee member expressed that the committee should give Guest Banks some of the context of the big conflicts that have arose at the UA. They explained that the committee should ask if there is anything that Guest Banks would like to collaborate with the DEI on currently. What does she currently have? What does she think she needs? The committee wants her to ultimately be successful.

Committee spent significant portion of meeting addressing how to get a better pulse on some of the (DEIoriented) issues that faculty as a whole want looked at or talked about? Equity between junior faculty and regular faculty was brought up and the fact that it is difficult to find a system to manage this more effectively. The system the UA has is legal-policy oriented steps and when that does not work, it gets handled on a case-by-case basis with the dean or the provost. There are issues of transparency with this method which creates worse problems of fairness. A committee member expressed that the committee is committed to inclusion, diversity and systemic equity. We should try to create systems of equity so that it does not have to be a case-by-case scenario, but that the culture at the UA be a culture of equity. A committee member brought up that a culture of equity does not happen overnight. Output items established, as follows:

- The committee is going to create a flowchart or map of who does what.
- The committee is going to create a statement on hate speech vs free speech. There needs to be firm parameters for where hate speech begins and free speech ends.
- The committee members will commit to tracking and reporting the issues they see- racism, microissues, the eruption of hate into the public. What is lacking is the accountability structure. ASU put into effect twenty-five different initiatives for equity; can the committee start small with three or four and work their way up? The persons of color community in Phoenix helped push this change. A committee member asked if connecting with ASU could help the DEI committee with this issue. A DEI Accountability Project was proposed.


### 11.24.20 Meeting

Activities: Reviewed agenda for time/items to be prioritized for discussion with Ivy Banks; reviewed and discussed student input on DEI issues gathered from student leaders by ASUA rep.
Guests: Ivy Banks
Summary: Committee members introduced themselves and provided background on institutional DEI issues-including the formation of the committee. Went on to discuss Ivy's role and priorities. She needs more feedback to understand the dynamics of the UA as an institution. Guest Banks recognized Member Tsosie for her work (with students and staff) with diversity and inclusion. Guest Banks feels that the first piece that needs to be looked at is sustainability: knowing that there have been multiple people in her role before, how does the UA sustain this culture when there are transitions in leadership? She explained that the work of DEI is with everyone, it does not stop just with her. It is not one office or one person that does the work. The D\&I department will be a place where the work all comes together. Diversity and Inclusion is multifaceted, and she is just the conductor. A lot of the work is done locally at the college level and she can help bring things together across the institution as a whole. In order for DEI to be sustainable, the institution needs to ask how we are holding ourselves accountable?

Guest Banks explained that at each level- senior leadership, DEI committees at the college level, the strategic plan- accountability for the DEI work that was being done was not there. How will we hold ourselves accountable and what does that look like at the different levels? Guest Banks told the committee that she is working with ASUA in creating a taskforce to get the equity course in the curriculum up and running. The taskforce will also help to navigate the political and institutional landscape with regards to getting that taken care of. She works with COBA every few weeks to work through those pieces and is looking to hire a project director to help as well. She has also met with campus police to talk about how UAPD can work better for the students and faculty/staff with regard to diversity and inclusion. An entity was hired by the UA to help with having these hard conversations with UAPD. Guest Banks asked how she can amplify the DEI's voice. What can she work on to amplify that voice across the campus? Projects or priorities? Guest Banks feels it is important to build a community surrounding DEI in order to sustain change.

### 3.9.20 Meeting

Activities: Wellness check on committee members—most of whom identify as marginalized faculty/students, who have suffered direct impact of the very issues being worked on by committee. Discussion of new spate of problematic DEI concerns that arose during Spring (since last meeting) i.e. Black History Month programming, change in Ombuds Office model, etc.; revisited some ongoing topics from last semester-healthcare plan change, shared governance/relationship to Senate, leadership.
Summary: Currently the Ombud system is not up and running at the UA. There is concern over multiple things including criteria, training, and timeframe of switch. This model was used before and there is question to why the UA is going back to a model that was used in the past and eliminated. The committee would like to know why something is being eliminated without having another plan already in place? The UA needs to have a way to solve issues that arise and needs to have an office for people to go to get help
when they need it. Committee member expressed that it is important to have a committee member attend SenExec and give report so that everyone knows what is going on with the committee. A committee member will put together some bullet-points to discuss at the next SenExec meeting so the campus will know what the committee has been working on. A committee member brought up AIB and money allocation based on value. Different units have different credit cost per hour so it takes some departments more students to make the same amount of money which is not equitable. Another committee member expressed that when looking at the strategic pillars of AIB, DEI is near the end which suggests a lack of importance from senior leadership. The committee members discussed the current budget and the lack of transparency on it. They would like to get a snapshot of how much CARES Act money the UA got and where the money went. A committee member brought up the possibility of using a public records request to get the information. A committee member will reach out to the chair of SPBAC (Sabrina Helm) to see if they have the information to share. Lastly, the committee decided to devote time to clarifying how to achieve modest goal of documenting the truth on the variables that are concrete: resources, faculty, student experience, campus climate. This might include doing an end-of-year document from the committee's point of view showing where the UA is in a DEI space; this document would be an addendum, updating the extensive report compiled by member Tsosie in 2019.

### 3.23.20 Meeting

Activities: Continue to discuss ongoing issues of shared governance, DEI committee structure and membership, follow-up regarding CARES Act funds.
Summary: Committee members discussed the committee's composition for next year. A committee member suggested that a few members stay on the committee to help continue the conversation from this year and guide the new members. The committee will also need a post-doc. A committee member suggested that Ivy Banks be the ex-officio member for next year so that she can be regularly included. Chair Troutman will be stepping down from the committee due to a different committee commitment. For student member recommendations, the committee will reach out to ASUA and GPSC. The committee members gave recommendations for possible new members; the committee will contact them for interest. Things to keep on radar: Ashford (UA Global), AIB, new Gen-Ed policy, SGRC.

### 4.6.20 Meeting

Activities: Focus on HIS initiative info; OMBUDS and CARES updates and final meeting for AY 20-21. Summary: A committee member spoke to Ivy Banks and asked if she would be willing to come to a future meeting. Dr. Banks said she would be willing and asked for a representative from the committee to reach out to her to set it up. Committee members discussed inviting Dr. Banks to the final meeting of the year on May 4, 2021.
The committee members discussed future appointments for the committee. A committee member asked about the Ombud situation on campus and if there are any new updates. A committee member expressed that the UA has moved with mediation services but there is nothing in the bylaws. A committee member brought an issue to the committee that a career track faculty member is having. The faculty member was referred to the DEI committee by Andrea Romero. The committee member explained that they helped the faculty member construct an appeal letter and advised them to contact the Ombud's office. The committee discussed the issue and talked about possible next steps for the faculty member. Ultimately the faculty member would like their job renewed, a new reporting line and a complaint against the director of the college with some action of reprimand. They also need their visa status resolved. A committee member brought up the roles of dean's and the fact that they take on HR responsibilities at times. The committee member would like to know what HR's role and jurisdiction are-
and what are not. A committee member brought up a question that was raised in the faculty senate about furlough money and the projections that were given from the prior year. There seems to be money missing and the answers that are given have not been transparent. A committee member asked about quarterly reports of the institutional half of CARES money; the provost should be sending out reports at some point. A committee member pointed out that issues of finance become important in terms of resources for students and in terms of equity. In order to find an investment to commit to, it is necessary to know where the money is being spent.

### 5.4.20 Meeting

Activities: Continue to discuss new committee members and composition; meet with guest, Helena Rodrigues (and team) to discuss DEI issues that are HR-related and how best to proceed in an effective manner when DEI and HR are entangled. Reflections on committee's work during AY 20-21 and generate brief list of takeaways and recommendations for incoming committee members.
Guest(s): Helena Rodrigues, AVP-HR
Summary: To be updated after the May $4^{\text {th }} 2021$ meeting.

Respectfully submitted,


Stephanie Troutman Robbins, Chair
Committee on Diversity, Equity, and Inclusion

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## University Committee on Ethics and Commitment

# UNIVERSITY COMMITTEE ON ETHICS AND COMMITMENT 2020-2021 Annual Report 

## UCEC Members:

Dr. Bernard Futscher CHAIR (6/18-5/21) (PHARM)
Dr. Michael Sulkowski VICE CHAIR (6/19-5/22) (COE)
Dr. Melissa Delgado (6/19-5/22) (CALS)
Dr. Sheila Gephart (6/18-5/21) (NUR)
Dr. Kurt Gustin (6/20-5/23) (COM)
Mr. Stephen Hussman (6/20-5.23) (LIB)
Ex officio: Mr. Scott Pryor Research Integrity Officer (RIO)

## Mission (from Faculty Constitution, Article V, Section 7)

"The University Committee on Ethics and Commitment shall deal with questions of misconduct in research, scholarship, or creative endeavor; conflict of commitment; and facilities misuse; and receive reports from the Research Integrity Officer. In its deliberations it will use the current versions of the University policies on research integrity, professional commitment and proper facilities use."

See also the inquiry function of the UCEC as described in UHAP 2.13.09: "Policy and Procedures for Investigations of Misconduct in Scholarly, Creative and Research Activities."

The Committee's Annual Meeting was held on September 8, 2020.
The Committee held two Inquiry Panels during the 2020-2021 academic year. The first Inquiry Panel was charged to investigate a complaint of allegations of research misconduct on February 22, 2021 by Scott Pryor, Research Integrity Officer. The Inquiry Panel investigated the allegations by reviewing evidence, consulting outside experts and interviewing witnesses. The Panel submitted a report with Findings and Recommendations to Scott Pryor on April 16, 2021. A second Inquiry Panel was charged to investigate a different complaint of allegations of research misconduct on March 16, 2021 by Scott Pryor, Research Integrity Officer, and is ongoing at the time of submission of this annual report.

Respectfully submitted,

Dr. Bernard Futscher
Chair, UCEC

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# Committee on Faculty Membership 2019-2020 Annual Report 

## Members:

Dr. Amy Fountain, CHAIR, Secretary of the Faculty (6/16-5/20)
Mr. Michael Brewer, LIBR (6/14-5/20)
Dr. Andrea Romero, ex officio/non-voting
Dr. Judd Ruggill, COH (6/17-5/20)
Dr. Jonathan Tullis, COE (6/16-5/20)

Our committee met on four occasions to review petitions for membership in the General Faculty, and to make recommendations about the role of non-employee faculty in shared governance. Our recommendations have been forwarded to the relevant committees and individuals.

Respectfully submitted

Amy Fountain, Chair
Committee on Faculty Membership

Grievance Clearinghouse Committee 2020-2021 Annual Report

## Committee Members

Dalila Ayoun, COH Chair, CAFT<br>Bernard Futscher, PHAR Chair, UCEC<br>Dian Li, COH<br>Vice-Chair, CAFT (Non-voting)<br>Kristen Klotz<br>Director, Office of Institutional Equity<br>John Leafgren, COH<br>Elected Faculty Senator<br>John Milbauer, COFA Chair, Committee on Conciliation<br>\section*{Mission}

The Grievance Clearinghouse Committee shall be the faculty committee that accepts faculty members' written requests for grievance hearings and which determines which committee (Conciliation, Committee on Academic Freedom and Tenure, University Committee on Ethics and Commitment) or process (Office of Institutional Equity) should consider a grievance.

## Petitions

The Committee reviewed seven petitions in the 2020-2021 academic year:

- A complaint from a faculty member was received on July 10, 2020 regarding salary cuts. The Committee declined to refer the case to any of the committees that fall under its purview because it fell outside of the purview of the Committee.
- A complaint from a faculty member was received on July 30, 2020 alleging attempts to curtail academic freedom. The Committee referred the case to the Committee on Conciliation.
- A complaint from a faculty member was received on October 14, 2020. An amended grievance was submitted on October 28, 2020. The Committee requested supplemental information from both the grievant and the respondent, met to discuss the case in light of the new information. The Committee concluded that the grievance could not be heard because the grievant was awarded due process, and the grievant's request fell outside the purview of the Committee.
- A complaint from a faculty member was received on December 17, 2020. The GCC unanimously concluded that the grievance could not be referred to any of the committees that fall under its purview because the grievant was no longer a member of the General Faculty. The grievance was filed on the same day as the last day of employment. The Grievance Policies and Procedures for Faculty outlined in the Bylaws state that the process provides "review procedures for members of the General Faculty." Article II of the Faculty Constitution limits the definition of "General Faculty" to those individuals "who hold" faculty appointments or who have Emeritus status.
- A complaint from a faculty member was received on January 3, 2021. The GCC unanimously concluded that the grievance could not be referred to any of the committees that fall under its purview because the grievant was no longer a member of the General Faculty.
- A complaint from a faculty member was received on May 1, 2020 regarding a reprimand from a Dean. The Committee referred the case to the Committee on Conciliation.
- A joint complaint from two faculty members was received on March 15, 2021 regarding a letter of reprimand from a department head. The case was referred to CAFT, the Chair conducted pre-hearing interviews of the grievants and respondent, consulted with the OGC and met with a panel constituted to review the case. The panel unanimously decided to refer the matter to the Committee on Conciliation.

The Chair is grateful for the work and expertise of GCC members, all of whom volunteer their time to serve on this important shared governance committee.

Respectfully submitted,


Dalila Ayoun, Chair Grievance Clearinghouse Committee

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# Research Policy Committee 

## ANNUAL REPORT 2020-21

## Committee Members:

Dr. Paul Gordon, CHAIR, COM-T (6/19-5/21)
Dr. Rebecca Crocker, Postdoc (12/20-5/21)
Dr. David Cuillier, SBS (6/20-5/21)
Dr. Wolfgang Fink, ENGR (6/20-5/21)
Mr. Daniel Lewis, GPSC (6/20-5/21)
Dr. Stanley Pau, OSC (6/11-5/21)
Ms. Isabelle Perea, ASUA (6/20-5/21)
Dr. Marlys Witte, COM-T (6/13-5/21)
The main activity of this past year was to work on the...

1. Research Cores Policy Development - we continued with the work from last year in preparation for our meeting with RII
2. Review of Draft Policy Documents from RII - on review of their edits to our document, we chose to meet 'in-person' with RII. In email correspondence before the meeting, we stated that we were not 'on the same page'.
3. Research Cores Policy Discussion with RII Representatives - our meeting with RII led to an outstanding meeting of our minds and significant progress around the issue of Shared Governance. The revised policy document from RII was very similar to ours and the RII Core Steering Committee was formed in a shared governance model as we had suggested.
4. Updates on RII Core Steering Committee Meeting - Dr. M. Witte attended the first Steering Committee meeting and told RPC that discussions were good and shared governance was moving along.
5. Discussion of IDCs - as the year ended and the new year began, we embarked on a discussion of IDC distribution - more to follow as the year continues.

Respectfully submitted,
Dr. Paul Gordon
Chair, RPC

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## Shared Governance <br> Review Committee

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# Shared Governance Review Committee 

Annual Report 2020-21

## 2020-2021 Membership:

Faculty
Melanie Hingle, Vice Chair of the Faculty \& SGRC CHAIR
Jessica Summers, Chair of Faculty
Sabrina Helm, Co-Chair SPBAC
Diana Liverman, SPBAC Member
Leila Hudson, Senator
Paul Gordon, Senator
Administrators
Liesl Folks, Provost
Betsy Cantwell, Senior Vice President, Research, Innovation, and Impact
Laura Todd Johnson, Senior Vice President for Legal Affairs
Staff
Jennifer Lawrence, Chair of Appointed Professionals Advisory Council
Jeffrey Jones, Chair of Classified Staff Council

## Students

Shilpita Sen, President, Graduate and Professional Student Council
Tara Singleton, President, Associated Students of the University of Arizona

## Mission of Committee as Outlined in the Constitution of General Faculty:

The Shared Governance Review Committee addresses issues regarding the implementation and functioning of the procedures contained in the Shared Governance Guidelines and Agreements as may be entered into from time to time. It will establish and maintain processes to (1) review compliance with the agreement, (2) examine ways in which apparent breaches of the agreement can be addressed, and (3) consider possible extensions of the agreement. It is the body to which members of the University community can bring particular shared governance concerns, and it will also examine whether the agreement has been violated or is in need of clarification or modification.

## 2020-2021 Summary

The Committee was reconstituted in Fall 2020 after more than a decade. Members convened five times over the course of AY20-21: December 10, 2020, January 22, 2021, February 18, 2021, March 19, 2021, and April 19, 2021 (see below for activities and agenda). Primary tasks were revisiting (and as needed, revising) the Committee charge, establishing a shared understanding of shared governance, and producing a set of guidelines by which the faculty and administration could agree to work moving
forward (the Shared Governance Memorandum of Understanding (MOU), and a proposed Shared Governance (SG) "Playbook," designed to onboard new colleagues and remind current members of shared governance processes at the University of Arizona).

December 10, 2020 Agenda: What we are doing well, what we could be doing better; establishing goals for the group. Summary of the discussion and next steps: Members were oriented to the charge of the committee (revised MOU, address health of SG and help solve issues/disputes that arise), history of the group (haven't met in over a decade) and asked to comment on what was going well at UArizona, and what could be better. Possible goals for the academic year were discussed, including an updated MOU that was acceptable to all constituent groups.

January 22, 2021 Agenda: Member beliefs \& perspectives about shared governance. Summary of the discussion and next steps: A member sent out a brief survey to other members to solicit opinions / beliefs about SG, to use the resultant data as a conversation piece. Members from one constituent group did not complete the survey but did participate in the discussion. Members expressed views of Senate including "ceremonial", "privileged", and had the most "power" of all SG groups. Positive transformation of another SG group-SPBAC - was noted by several members, as was the differences between SPBAC and Senate (both positive and negative). The idea of a "University Senate" (inclusive of staff, student issues) was discussed, with most agreeing that this might be better served as another group (or even by SGRC) and not taking away from what is already in place. It was suggested that members look at other SG models to take away best practices; members made suggestions and the list was circulated prior to the next meeting (Feb).

February 18, 2021 Agenda: What are big ideas from the MOU. Our definition of SG. Other models of SG around the U.S. Summary of the discussion and next steps: Members discussed the focus on faculty (since this is the focus of the original committee, and the MOU) but emphasized the importance of inclusivity, especially with regard to staff and students. The MOU was discussed as only one aspect of the Committee's charge, and that the members could be tasked with solving problems, and /or suggesting a "playbook" by which new and returning members of SG would understand everyone's roles. The importance of Committee work that is built up was also emphasized, including a more accessible website / repository. The discussion turned to the definition of shared governance, of which members had diverging and diverse perspectives - e.g., some thought SG was to "counterbalance managerial power", and/or a "check and balance system", while others believed "everyone at UA has responsibilities and should be accountable for their decisions and roles" and while not everyone can participate in every meeting, there should be clear mechanisms for soliciting feedback and sharing input.

March 19, 2021 Agenda: Indicators of a functioning SG system - quantitative and qualitative indicators. Pre-read/conversation piece: "Implementing Shared Governance at the University of Arizona." Summary of the discussion and next steps: Members had a robust discussion about the way in which information is currently shared, and the timing of the sharing, and how this needs to change; additional conversation focused on who among the faculty \& other constituent groups need to be 'at the table' for discussion and decisions. One member suggested a shared governance 'dashboard', which would focus on the guiding principles of shared governance and should reflect measurable indicators of what is / is not working. The discussion turned to aspects of the revised MOU (August 2020 version), which were not acceptable to all SGRC members and constituent groups. In particular, the 2020 MOU proposed expansion of the SG groups to include C11 (which is a general faculty committee representing the faculty, and not explicitly listed in the Constitution \& Bylaws as a SG group) and lacked measurable
indicators of when SG was functioning/not functioning. A member offered to revise the draft MOU with an eye to shortening / making more concise and sent out to the group for considering in between the March and April meeting.

April 19, 2021 Agenda: Inclusion of staff and student constituent groups; looking ahead to AY21-22. Summary of the discussion and next steps: Members reviewed the draft MOU (and heard the feedback of 3 additional members) which one member disaggregated into 2 documents, a set of "Guiding Principles" (enduring, revised infrequently) and an "Implementation Plan" (operationalizing SG principles, revisited annually). Members were generally accepting of the new format and saw value in the separation of principles from operationalization of the principles; however, some of the content was debated, specifically, the degree to which SPBAC was involved in strategy \& planning, and non-trivial debate over the meaning of words in the document. Members agreed to move forward to complete a draft by end of this AY, with a plan to develop the implementation plan this fall when we convene again.

New members will rotate on to this committee over the summer according to the bylaws and membership requirements for this Committee. Quarterly meetings are planned for AY21-22.

Respectfully submitted,


Melanie Hingle, PhD, MPH, RDN
Vice Chair of the Faculty 2020-22
Chair, Shared Governance Review Committee 2

Strategic Planning \& Budget Advisory Committee

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THE UNIVERSITY OF ARIZONA STRATEGIC PLANNING \& BUDGET ADVISORY COMMITTEE

ANNUAL REPORT 2019-2020

| Barry Brummund | Sydney Hess | Lisa Rulney |
| :---: | :---: | :---: |
| Co-Chair, Chief Information Officer, | ASUA President |  |
| UITS Administration |  | CFO |
|  | Melanie Hingle |  |
| Sabrina Helm | Nutritional Sciences | Andrew Schulz |
| Co, Chair, Family \& Consumer |  | Deans' Representative, Fine Arts |
| Sciences | Jane Hunter |  |
|  | VP, Strategic Initiatives | Robert Stephan |
| Dalila Ayoun |  | Religious Studies and Classics |
| French and Italian | Mr. Jeffrey Jones |  |
|  | Classified Staff Council | Jessica Summers |
| Brian Berrellez | Representative | Chair of the Faculty, Education |
| Appointed Professionals Advisory Council Representative |  |  |
|  | Samuel Keim | Melissa Tatum |
|  | Emergency Medicine | Law |
| Meg Lota Brown |  |  |
| English | Irving Kron | Marilyn Taylor |
|  | Senior Associate VP, UA Health |  |
| Melinda Burke | Sciences | Administration |
| VP, Alumni Relations \& President, UA Alumni Association | Interim Dean, College of Medicine |  |
|  |  | Marie Teemant |
|  | Diana Liverman | GPSC President |
| Elizabeth Cantwell | Geography \& Development |  |
| Senior VP, Research and Innovation |  | Stephanie Troutman |
|  | Marc Miller | English |
| Peter Dourlein | Deans' Representative, Law |  |
| Assistant VP for Planning Design \& |  | Kendal Washington White |
| Construction | Steven Moore | Vice Provost, Campus Life |
|  | Senior VP \& Chief | Dean of Students |
| Jim Florian | Marketing/Communications Officer |  |
| Associate VP for Institutional |  | Kathy Whisman |
| Analysis | Celina Ramirez | Senior Associate VP \& Chief Budget |
|  | VP, University Initiatives | Officer |
| Liesl Folks |  |  |
| Senior VP for Academic Affairs \& | J.P. Roczniak | Brent White |
| Provost | UA Foundation President | Vice Provost, Global Affairs Dean, Global Campuses |
| Greg Heileman | Helena Rodrigues |  |
| Associate Vice Provost for Academic | VP \& Chief Human Resources |  |
| Administration | Officer |  |

## KEY COMMITTEE ISSUES AND ACTIONS

## 1. RE-ENVISIONING SPBAC: MISSION AND GUIDING PRINCIPLES

A key task addressed in AY 2019/2020 was to redefine SPBAC goals and functions in light of the committee's decreased involvement in strategic and budget decision-making. SPBAC Guiding Principles were discussed and put to the test on several occasions throughout the year, addressed in SPBAC reports in Faculty Senate.

The committee conducted small group exercises to determine priority topics for SPBAC. These are:
a. annual budget changes
b. RCM model / allocations
c. faculty / staff / GA hiring and compensation
d. student recruitment and financial aid
e. strategic planning and strategic priorities

For these priority topics, SPBAC role in decision-making is consultative; however, SPBAC expects to be involved in early stages of decision-making, and not to be informed retrospectively after significant decisions have been made by senior leadership.

## 2. FINANCIAL YEAR 2020 BUDGET

The second dominant topic for SPBAC was the university budget. The budget reallocation process for FY2020 was of great concern to SPBAC members and has led to increased sensitivity regarding SPBAC's (and faculty's) involvement in major budgetary decision-making. SPBAC played no role as consultative organ of shared governance with respect to the budget reallocation.

The need for the budget reallocation arose from net tuition flattening which required a reallocation to solve immediate budget shortfall. Net tuition revenue was expected to be down $\$ 26$ million due to changing demands/expectations from students and the higher discount rate offered to students as an outcome of the strategic goal to increase the quality of the incoming student cohort (a decision also not significantly discussed with SPBAC). The budget was updated in the fall and the reallocation implemented in the spring. A total of $\$ 36$ million had been reallocated; Provost Folks and CFO Rulney explained the basics and mechanics of the budget reallocation in several SPBAC meetings. Rulney presented details on threats to growth including possible future economic downturns and continued divestment in public higher education.
SPBAC members expressed deep concern about the lack of involvement of SPBAC in the deliberation phase of the budget reallocation process and expressed that - in such situations - SPBAC needs to play a consultative role prior to implementation of budget cuts. The process highlighted the need for a review of SPBAC role and process, as well as the perceived obligation senior leadership has in involving SPBAC. To provide timely and productive support, SPBAC co-chairs suggested that the committee could work in smaller groups for focused and timely feedback to senior leadership; that SPBAC meeting schedule could be changed to focus on recurring budget themes; that data updates could be integrated into each meeting session to provide better basis for ongoing dialogue about budgetary concerns.
In light of the unprecedented negative impact the coronavirus (COVID-19) pandemic has for the university, SPBAC switched the later half of the spring meetings to a different format, focusing on updates from the Financial Sustainability Emergency Response Taskforce in an effort to provide consultation for the rapidly evolving financial crisis of the university. SPBAC members were appointed to task force working groups.

## 3. FACULTY AND STAFF COMPENSATION

Compensation was a central topic for SPBAC. Specific topics addressed this AY were: UCAP, faculty compensation and pay equity, merit increases, and furloughs.

Jan Myers, Director of Compensation, presented on matters of UCAP and faculty compensation including timelines and project milestones. Fifteen different pay structures were modeled based on peer groups and benchmarks. The pay structure was targeted at the market medium. A phased-in implementation strategy had been recommended and started in January, 2020.

Faculty pay equity was a topic discussed on a recurring basis, with Provost Folks presenting on project progress in several meetings. The pay equity review began with the objective of looking for systemic inequity in base salary on the basis of gender, race, and/or ethnicity. A legal review in late 2019 found no such systemic issues. The next step was an internal review for non-systemic issues beginning in early 2020. Recommendations and salary adjustments were completed in March 2020. An elective review process is ongoing. Salary adjustments are planned to be honored despite budget cuts due to COVID-19.

The process by which merit increases should be implemented was another topic of concern to SPBAC. A survey among SPBAC members was conducted to identify preferences for merit increases on the college/department level versus a centrally funded approach with institution-wide guidelines; the inclusion of graduate students in the same merit increase program; the timeline for implementing merit increases and other details. Provost Folks expressed that the responsibility to compensate employees appropriately is not tied to only those units which generate a budget surplus. The potential positive impact on faculty morale and stress levels was considered by the committee with transparency of the merit increase process emphasized.

Finally, in late Spring 2020, SPBAC discussions were dominated by senior leadership's decision to implement a furlough to meet the need for substantial decrease in expenditures due to COVID-19 crisis. SPBAC members again noted with concern that SPBAC was not involved significantly on the issue, or size, of the furloughs. Given the need for rapid decision-making in the evolving budget crisis, SPBAC cochairs suggested that SPBAC needs to be represented in the SLT (Senior Leadership Team). SPBAC members were polled and agreed to continue SPBAC meetings during the summer months of 2020.

## 4. GRADUATE STUDENT STRATEGIC ISSUES

Meg Lota Brown, Director of the Graduate Center, and Andrew Carnie, Vice Provost and Dean, Graduate Education, led a discussion on the Graduate Center and professional resources provided to graduate students. Members were informed about graduate assistants and associates' workload and compensation based on a workload survey conducted in 2017 and repeated in 2019. Carnie provided recommendations to the committee including the creation of a systematic way to ensure graduate assistants and associates receive reviews and feedback, creation of an infrastructure to allow contracts to be circulated to graduate assistants and associates, investment in a TA training program and investing in mentorship training for faculty and graduate students, and the creation of clear policies on GA workload. Finally, he suggested a minimum stipend amount based on cost of attendance less tuition, extending the full tuition benefit to .25 graduate students, and the creation of a tuition insurance pool. The committee plans to revisit these recommendations to review progress made.

## 5. STUDENT ENROLLMENT AND RETENTION

Kasey Urquidez, Vice President, Enrollment Management, presented to the committee an overall snapshot of enrollment and updated the committee on the 2025 and 2035 enrollment goals including the current status of academic quality goals. The survey of admitted students indicated that affordability replaced availability of a desired program as the No. 1 reason students chose UA. Urquidez addressed
demographic changes including the projection that traditional student numbers are not expected to increase. Committee members discussed concerns surrounding revenue streams and the role of financial aid in recruitment.
Cynthia Demetriou, Vice Provost, Student Success and Retention Innovation and Roxie Catts, Principal Advising Officer/Director, Advising Resource Center, informed the committee with regard to Student Success and Retention Innovation (SSRI) activities and initiatives. Committee members discussed avenues for formalizing the advice that faculty provide to students and expressed the need for student representation on committees. SPBAC has a particular interest in issues surrounding financial aid initiatives and cost of attendance.

## 6. EQUITY, INCLUSION, AND TITLE IX

Ron Wilson, Vice President, Equity-Inclusion and Title IX Administrator, presented to the committee regarding the newly formed Division of Equity, Inclusion \& Title IX. Committee members discussed related issues and concerns with Wilson, including the need for more alumni of color for students to engage with, financial and retention support, mandatory training including implicit bias training for search committees and promotion and tenure committees, and training sessions that are specific to concerns unique to Arizona. Committee members suggested to build an accountability structure into training, and supported the offer of a mandatory training on Title IX. A Title IX-training for all SPBAC members could not be completed due to personnel changes in the new division.

## 7. STRATEGIC PLANNING

A focus area for SPBAC is strategic planning, specifically the newly implemented Strategic Plan. In fall, Jane Hunter, Vice President, Strategic Initiatives, presented an overview of the progress made with regard to the implementation of the Strategic Plan. There were 65 strategic initiatives in total, and 65\% of these had been launched at the time of Hunter's report. She also updated the committee on strategic plan communications including the formation of a group to evaluate existing communications about the plan and identify ways to optimize communications. Committee members expressed concern about how the Strategic Plan and goals are to be aligned with college-specific strategic plans and goals, and repeatedly noted that faculty involvement in the development of the plan, its "pillars" and initiatives was low. Hunter discussed with members ways SPBAC can be of assistance in the further implementation of the Strategic Plan. SPBAC co-chairs suggested that a new model of SPBAC inclusion in the early stages of strategic planning is needed to make best use of the committee's consultative function.

Due to the COVID-19 budget crisis, issues of strategic planning were underrepresented in SPBAC discussions during the spring.

## 8. ARIZONA ONLINE, UA GLOBAL, DISTANCE RECRUITMENT STRATEGIES AND MARKET POTENTIAL

SPBAC discussed UA Global initiatives and the status of Study Abroad. Brent White, Vice Provost, Global Affairs updated the committee about strategies of UA Global, specifically with regard to microcampuses, and provided details on the process for developing a new micro-campus. He responded to questions from committee members regarding micro-campus faculty and enrollment. White provided information about issues that have arisen with micro-campuses including the early impacts of the coronavirus.

In another session, SPBAC discussed the revised UA Study Abroad Program's objectives and goals, specifically the plan to become the national leader in study abroad. White discussed the financiallymotivated need to triple the number of students on faculty-led programs, and the need to increase the number of students on exchange programs six-fold. He indicated UA has one of the largest study abroad
programs in the nation but is not ranked within the top 10 . Committee members expressed concerns that neither SPBAC nor faculty had been significantly involved in the revision of Study Abroad, and also questioned the goal-setting process, noting that there is unclear benefit for UA in attempting to be among the "Top 10."

## SPBAC CO-CHAIRS' FINAL REMARKS

In light of changes on senior leadership and SPBAC level in the fall, and the failed shared governance process with regard to the Spring 2020 budget reallocation, we make the following recommendations:

## 1. Implementation of Shared Governance Principles on Senior Leadership Level

We recommend that faculty members elected by the general faculty be included in the membership of the Senior Leadership Team on a continuous basis (also after COVID-19). At minimum, we expect the Chair of the Faculty to be included, preferably also a SPBAC co-chair. This serves to shorten the communication channel between senior leadership and faculty, increases transparency and perceived goodwill, and speaks to the shared governance principles we uphold.

## 2. Faculty Advisory Board to the Chief Financial Officer

We recommend the institution of an Advisory Board to the CFO consisting of the Chair of the Faculty, SPBAC Chair/Co-Chairs, and faculty members, for example appointed from the pool of elected faculty members serving on SPBAC. This enables continued, timely and more informed consultation with SPBAC in ongoing budgetary issues, as well as transparency of the shared governance process in terms of budget issues.

Under its current leadership, SPBAC has undergone a repositioning process. As a result, SPBAC co-chairs have proposed to implement following changes for the future (past COVID-19 crisis):

1. Implement a schedule of recurring topics based on identified priority topics (see above)
2. Providing SPBAC members with a monthly scorecard with metrics on priority topics based on a strategic initiative for UAIR

## 3. Reconfirm the role of SPBAC with university leadership.

It is our hope and expectation that decision-making processes in SPBAC priority areas, and other areas of university-wide budgetary and strategic relevance, will involve consultation with SPBAC in early stages of the decision-making process to enable a pro-active and consultative function for SPBAC. We wish to provide efficient decision-support for senior leadership, while also working effectively in the sharedgovernance process.


Barry Brummund SPBAC Co-Chair


Sabrina Helm
SPBAC Co-chair

# THE UNIVERSITY OF ARIZONA® STUDENT AFFAIRS POLICY COMMITTEE <br> Faculty Center <br> 1216 East Mabel Street - PO Box 210456 <br> 621-1342 (Fax: 621-8844) <br> facultycenter@email.arizona.edu <br> <br> Student Affairs Policy Committee <br> <br> Student Affairs Policy Committee Annual Report 2020-2021 

 Annual Report 2020-2021}

## SAPC Members:

- Diane Ohala, Chair, Linguistics
- Sonia Batsheva Kaufman, GPSC
- Cheryl Cuillier, University Libraries-Research \& Learning
- Yijun Ding, College of Optical Sciences
- Kristen Little, English
- Kimberly Marchesseault, Management and Organizations, Eller
- Matthew Mugmon, Fred Fox School of Music
- Timothy Ottusch, Family Studies \& Human Development, CALS
- Tara Singleton, ASUA
- Jeff Stone, Psychology
- Kendal Washington White, Dean of Students, ex-officio (8/09- )

During the academic year 2020-2021, the committee met June 3, 2020; July 8, 2020; August 5, 2020; September 9, 2020; October 14, 2020; December 9, 2020; February 10, 2021; April 14, 2021, and May 5, 2021. Details and highlights are provided below.

Highlights for June 3, 2020 included:
Discussion of new student enrollment data and SSRI survey of student challenges: Committee members discussed new student enrollment data shared by Kasey Urquidez, Vice President, Enrollment Management at the June 1, 2020 Faculty Senate meeting. Chair Ohala directed the discussion to focus on ways to help create a better learning environment for students of disadvantaged populations who may be dealing with institutional racism in conjunction with COVID-19. The committee tasked themselves to think of ways to help students returning in the fall (in any capacity) who may be returning from a state of anxiety and trauma, including reaching out to OIA.

Additional discussion of enrollment trends shared by Urquidez included noting that $34 \%$ of those surveyed reported some loss in family income; $64 \%$ think they will have to delay their
college experience. Chair Ohala noted that students report experiencing inconsistency with how instructors handle online teaching, noting reports of online courses requiring more work, instructors not using D2L, and some students may not be in a safe or productive space at home-compromising their ability to participate in the course. She suggested SAPC may have a role in smoothing out the online instruction experiences of students in the fall.

Committee members also discussed the need for safeguards for the student experience, noting that having different levels of teaching modality doesn't solve problems of students not hearing from instructors and poorly re-designed syllabi from in-person to online classes. Members asked what students should do if a professor is unprofessional or changes deadlines during an online course and if guidelines from the Teaching and Learning Group could be used to ensure an equitable class experience. Members also planned to ask OIA if there was anything that could be done to resume teaching assessment of courses/instructors.

Discussion concluded with Chair Ohala asking the committee members to identify student concerns from the SSRI survey via a shared document in the SAPC Box folder so that these concerns could be prioritized and shared with senior leadership and other relevant groups.

## Highlights for July 08, 2020 included:

International Student Visas: Committee members discussed the withdrawal of international student visas and suggested hybrid classes may offer a solution that allows students to stay on campus. The committee also discussed a potential workaround through independent study courses as they are, by definition, inperson courses. Committee member Stone asked if this workaround would be applicable to undergraduate students. Chair Ohala responded that communications through UA suggest it will work and students should work with appropriate departmental assistants to identify and help students sign up for independent study courses, as needed. Members discussed a potential downside to independent study registrations, stating students may encounter a delay in progress toward a degree if these credits are not needed.
Committee members discussed the lawsuits by other institutions connected to this issue. Member Marchesseault shared in Zoom chat the link to a petition on the subject for anyone who was interested in signing.

Student Regent Anthony Rusk Initiative: Chair Ohala shared that she was contacted by Vice Chair of the Faculty, Dr. Melanie Hingle, who was in conversation with Student Regent Anthony Rusk. Rusk wishes to draw Faculty Senate support behind an initiative about student basic needs, as these have worsened in light of COVID-19. Chair Ohala will join a conversation with Rusk on July 20th and will mention the initiative at the next meeting of the Senate Executive
Committee.
Food Insecurity: Chair Ohala shared an overview of a survey about food insecurity issues sent from Hingle. She also informed the committee about the ASUA website about basic needs and resources for students. She said she thought Rusk was working to get Regents behind a basic needs coalition because UA has surpassed other Arizona Universities on the issue so far. Committee members discussed the correlation of mental health, financial, and food issues.

Communications to Students: The committee discussed that communications about fall classes have been inadequate, both to students and instructors. As an example, she said in UAccess when modalities are changed by the instructor, the enrolled student is not notified - the only way for a student to know this change is to check their schedule. Ohala shared she is hearing from students they do not understand the difference between remote and online and think remote means synchronous video instruction and online means asynchronous video instruction. She added all global campus sections also said remote when main campus sections said online for the same course. Ohala also explained issues with searching for courses by modality in UAccess. Committee members discussed problems with communicating which classes are taking place with each modality and determined to start follow-up questions with the

Registrar's Office, Provost, and UITS. Committee member Stone suggested adding a message about this issue to all D2L classes. Ohala expressed she would communicate with Lisa Elfring and Mark Felix about this.

## Highlights for August 5, 2020 included:

Presentation and Q\&A with Student Regent Rusk: Rusk presented to the committee regarding basic needs insecurity. He identified basic needs as: food, physical health, housing, quality education, mental well-being, sense of belonging, financial support, and safety. Rusk stated the problems of basic needs access were complicated at the university level because of perceptions of college students surviving on basic items. He indicated food insecurity is three times the national average at the national level. Citing facts and figures, Rusk added the University had one of the nation's largest problems with food insecurity at the college level resulting from students no longer living at home and having to budget while losing the safety net of family. Rusk added, in context of the pandemic, many students who were food insecure became more so due to loss of family jobs or positions that supported them while on campus. Rusk stated that supporting the most at-risk students would lead to benefits for the state of Arizona as a whole and would encourage "thought leaders".

He also provided solutions to the problem of basic needs insecurity including:

- Creating the University of Arizona Basic Needs Coalition
- Making data-based decisions
- Shifting the culture and stigma around basic needs
- Becoming the thought leaders in Arizona on Basic Needs

Rusk provided an overview of what other institutions have done to address this issue including:

- Advocacy
- Research (UC and Alabama relied on research data)
- Connecting students to SNAP
- Expanding food pantries
- Creating basic needs centers
- Swipe Out Hunger
- Northern Arizona University's App
- Food scholarship programs; Farm scholarship programs
- Formation of campus basic needs security coalitions

He also shared the impacts of such programs and provided the example of food scholarship programs in Houston, Texas. In the programs he mentioned, students who received bags of groceries twice a month were retained at a rate of $60 \%$. The retained students earned a GPA of 3.05 (compared to 2.75 for those students not in the program).

Committee members discussed with Rusk the best way to move forward with the items suggested by the presentation. Members asked how often and at what scale basic needs insecurity is assessed. Rusk responded basic needs were assessed through an annual survey but also expressed the survey system used by UA may not be thorough and answers may not be comprehensive. Chair Ohala indicated the committee may be able to work with her connection to a committee that oversees surveys at UA. Chair Ohala also commented on the food scholarship program and suggested the outcomes from giving students groceries each week may be enormously beneficial. She added that the Campus Pantry collects card-swipe data and that may be a way to gather information about users and correlate effects on GPA and retention. Rusk stated the UA main campus is considered a food desert and the nearest grocery store is a mile or
more distant, presenting transportation problems to students. Committee member Little suggested the writing program could participate in getting information out to freshmen as they are positioned to interact with the majority of incoming students.
Chair Ohala stated she will start a Google Doc based on the presentation to SAPC and the committee would work to create starting points to share with Rusk regarding best practices. Chair Ohala asked the committee members what information they would like to see collected regarding students on campus. Member Stone responded there was need for information on factors effecting student outcomes on campus and if it would be possible to predict from a dataset retention, graduation rates, or GPA based on basic needs factors. He also asked the committee for advice to give Rusk on starting a center to work with survey data. Stone suggested to establish a center they would need data and guidelines on gathering data. The committee also proposed that Rusk present at the next meeting of the Faculty Senate.

## Highlights for September 9, 2020 included:

Basic Needs Coalition: Chair Ohala updated the committee on her meetings with Student Regent Anthony Rusk and Vice Chair of the Faculty Melanie Hingle regarding the Basic Needs Coalition Rusk is attempting to form. Ohala informed the committee she reported to the Senate Executive Committee (SENEXEC) regarding Rusk's work. Hingle reinforced the notion that this was a student-led initiative and Ohala suggested the need to support a student-led agenda.

Ohala said Rusk has been working with the Regents and they decided to establish a Basic Needs Taskforce at the ABOR level. Ohala informed the committee the taskforce will only focus on housing and food (out of the many factors contributing to basic needs insecurity outlined by Rusk in a previous presentation). She added this did not mean the other basic needs factors could not be addressed at the local level. Ohala added that Rusk was working with Tucson community members including local foodbanks.

Student Data Insight Strategy Team: Chair Ohala explained some of her involvement with the Student Data Insight Strategy Team which has been formed under the Provost. She said the group meets weekly and operates under the basic idea that data from surveys of the University population has not reached key stakeholders. She said the team was working to make it so information was adapted and refined for particular purposes and would work well with initiatives on campus. Ohala added there was an PhD student working on the needs of international students. She also stated Marla Franco was working on information related to pre and post-COVID emotional support for students and instructors. Ohala shared details about information needs at the University and encouraged SAPC members to identify items that were not included and could be added.

Wildcat Check-in: Ohala informed the committee the Wildcat Check-in survey was pushed out to students via D2L. The survey was listed on the top of student's D2L homepages and Ohala said she was going to share an email to spread awareness. She added the survey collected check-in data weekly and once a student opts-in to share this information, it was shared with OIA, CAPS, and housing services. Ohala said that questions were added about child-care based on committee feedback.

Ohala shared sample data gathered from the survey and explained that the survey asked students which types of support they needed and then matched them with resources to address the need. From the data she shared, Mental and Emotional Health was the largest need, followed by Financial Wellness. Ohala said the survey does not focus on D2L instruction and that OIA would be conducting future surveys specifically on D2L instruction. She added this survey could feed into initiatives such as the Basic Needs Coalition and allow SAPC to decide which issues to tackle first.

Ohala asked the committee to review responses to the survey via Box and highlight items for follow-up. She said graduate student responses were low and asked member Kaufman to follow up with GPSC to see if graduate students were receiving the survey in D2L. Committee member Marchesseault said she would share information about the survey to Eller listservs.

International Students: Chair Ohala provided information about a study regarding international students. She said the survey was focused on international students because the level of support provided to this population was lacking in comparison to other students. She added international students were a vulnerable population and disproportionately affected by the pandemic. Ohala broke down the social support offered to international students before and during the pandemic and stated international students felt less supported than peers. According to the survey she shared, 1 in 4 international students did not feel socially accepted. She said international students indicated they needed additional financial wellness and academic support services. Ohala suggested a future guest may be invited to the committee to discuss this subject.

Committee member Kaufman stated she will share information with GPSC regarding orientations and will check to see if there is an international student specific orientation. Committee member Ding said international students have their own orientations through the graduate college and the International Student Center is available but is more focused on legal/tax issues. She added it was up to groups of international students to create their own communities on campus. Member Hudson said that if the University is dependent on this demographic for financial reasons, then attending to these student's needs should be a priority. Chair Ohala said she would add items related to this topic to the SAPC Box folder and will look into the International Student Center and clubs.

## Highlights for October 14, 2020 included:

Basic Needs: Chair Ohala informed the committee that the presentation to Faculty Senate by Student Regent Anthony Rusk was well received. She said she met with Rusk regarding other constituents who were not necessarily on the radar for this group. Ohala reminded the committee there were two different levels at work with this item: the ABOR level where a working group focused on housing and food insecurity was established as part of a state-wide initiative and the Basic Needs Coalition, which is a local, UA-level coalition.

Financial Literacy: The committee discussed tying financial literacy to health and wellness concerns. Chair Ohala asked if Eller offered any financial literacy courses and committee member Marchesseault replied Eller did not offer courses and students were dispersed to appropriate campus resources. Committee member Mugmon added the Norton School teaches a popular financial literacy course. Chair Ohala stated she would follow up regarding the Norton School course added there was also a state-wide initiative called Take Charge Cats associated with this issue.

Survey Data: Ohala informed the committee she will meet with Lucas Schalewski, Director of Assessment \& Research, regarding survey data. She said Student Regent Rusk had asked about the adding questions specific to food insecurity that have been asked at other institutions to surveys at the University.

Mental Health Resources: Chair Ohala expressed that demand for mental health resources do not seem to meet demand. Ohala and Stone discussed that there is no formal relationship between CAPS and the psychology department. Stone clarified by saying that clinical psychology has a clinic that is focused on training and research purposes and the clinic does not have an emphasis on seeing patients in the facility. Stone offered to follow up with the clinical director to see if there are any offerings for students to use the clinic. Stone shared a response from the clinical director later in the meeting, stating there was a campuswide attempt to consolidate services under Executive Director, Student Wellness and Retention, Amy

Athey. The response indicated students were seen in the clinical health clinic but anything involving prescriptions were referred to CAPS. Stone shared a document detailing mental health services available on campus.

Outsourcing of the UA Bookstore Issue: Committee member Cuillier updated the committee on ideas presented during the previous Faculty Senate meeting regarding outsourcing of the UA Bookstore. She said UA currently has an independent bookstore and profits are returned to campus for scholarships and ASUA programs. Cuillier added the bookstore has tried to hire an outside consultant for an independent analysis of the outsourcing idea. She said there is a perception that the bookstore is subsidized by campus but, in reality, the bookstore pays back $\$ 6 \mathrm{~m}$ to campus and pays into the debt service of the student union.

Cuillier and Debby Shively, Interim Associate Vice President, Business Affairs - Auxiliary Services, will develop a report and presentation for Faculty Senate in November to inform faculty about the campus bookstore and implications of outsourcing for students. She added the bookstore does not charge sales tax, students may charge items to bursar accounts, and the bookstore worked to keep prices low. Cuillier spoke about the partnership between the library and bookstore regarding e-books and the inclusive access program.

Committee member Singleton said the partnership with the bookstore was a main financial resource for ASUA and it was vital the bookstore not be outsourced. Cuillier asked Singleton to speak at the November Faculty Senate meeting to oppose outsourcing. Committee member Marchesseault said the bookstore represented an important partnership with Eller as it was an on-campus business that helped students through experiential learning.

Cuillier said more information will be shared at an upcoming SAPC and that presentations on the topic would be made at SPBAC.

Fostering Success: Chair Ohala informed the committee about the Office on Fostering Success which helps students who were currently or had been homeless, part of the foster care system, or were experiencing housing challenges. Ohala suggested to Dani Carillo, Program Coordinator for Fostering Success that she present to Faculty Senate in future.

Lab Courses: Chair Ohala informed the committee about students who were told to purchase supplies ahead of fall classes but who may have had difficulty acquiring items due to housing or financial insecurity. She added that students were allegedly asked to purchase supplies in addition to lab fees they were paying and suggested that this was an issue the committee could investigate and bring to the attention of Senior Leadership. Ohala had already met with OIA and agreed to take point on this concern.

Ohala pointed to particular facets of this issue:

1. Financial issues and assumptions that all students have common household items. Some items were not common and not available during the pandemic.
2. Students were turning to the campus pantry to acquire food items for classes, not for consumption.
3. Students may not have access to physical space because kitchens and other spaces in residence halls are closed.

## Highlights for December 9, 2020 included:

Resources Access on UA Homepage: Chair Ohala informed the committee there is now a button on the UA homepage that connects students to virtual support services. She raised this issue at the previous
meeting of the Senate Executive Committee and Provost Folks connected her with relevant individuals that helped to address this need.

Health \& Rec Fees: Ohala stated students were upset because they were continued to be charged fees without using health and recreation facilities. She said the Provost directed her to Dean Washington White who said the fees paid for both recreation facilities and also health services on campus. The non-refundable fees were linked together to provide items such as counseling services, maintenance costs, and recreation programs. Students can request a refund of the campus recreation portion of the fee if they meet certain criteria such as being enrolled in an online-only program.

Update on Basic Needs: Ohala informed the committee there were two groups working out of UA on Basic Needs issues: one at the ABOR level (ABOR Working Group on Food Insecurity and Housing) and one at the UA level (Basic Needs Coalition). Ohala said she was also working with another group started by the Community Programs Manager of the Arizona Foodbank Network, which is a statewide initiative to pull together community resources in aid of supporting students at all three universities and the many community colleges. She said more people were joining these groups as the need arose and the official board and membership would be determined later when the local campus coalition is established.

Data Gathering Group: Ohala has received a request for a formal partnership between the Student Data Network (run by Lucas Schalewski, Director of Assessment \& Research) and the Chair of SAPC. She said she was willing to start in spring.

Testing For Spring 2021: Committee members discussed the announcement that students who are not tested may face punitive actions such as restricted access to UA WIFI. Member Singleton shared she planned to meet with GPSC President Sen and President Robbins but was not certain who would make the final decision. Ohala said restrictions on WIFI access would disadvantage populations that are always disadvantaged. Member Ottusch said a working group with the Provost on this topic would likely happen later in the week. He added CALS senators sent an anonymous survey to CALS faculty to gather ideas for compliance mechanisms. He said the ideas would be shared with Vice Chair of the Faculty, Melanie Hingle who could then share with the Provost.

Technology Access Question on Climate Survey: Ohala informed the committee the Basic Needs Coalition group at UA wanted to add questions to the Spring 2021 climate survey regarding technology access needs. She added the HOPE survey did not ask about technology. Members proposed that questions such as "to what extent is access to technology a barrier to success" and questions regarding access to course materials could be added to the survey. The committee discussed adding a checkbox question to indicate which resources students relied on to complete coursework and which contributed to their difficulties. Committee suggestions regarding these questions were transmitted to Lucas Schalewski, as requested.

## Highlights for February 10, 2021 included:

Basic Needs Groups: Chair Ohala informed the committee regarding the different levels on which work on basic needs has gone forward. She stated there was an ABOR working group that included all three Arizona universities, but not Arizona community colleges. A survey would be shared with the group to generate data that would be compared across the institutions. She added all of the Arizona universities had shared questions and each campus would be able to pick questions for their iteration of the survey. The shared questions were concerned with food and housing although the local survey also included questions about student access to technology.

Ohala also shared there was a community group headed by Alexander Meyer of the Association of Arizona Food Banks. This group would support students across the state and inform them of community and campus resources. Members of this group included Arizona community colleges. Ohala also said recent changes to SNAP may make more people eligible and allow for people on campus to work with that resource.

Student Resources Button: Chair Ohala discussed with the committee members the location of the button for student resources which appeared on the UA homepage and then was moved to the bottom of the page. Ohala stated this as a concern because students will likely look for assistance where they saw it before and may be discouraged from utilizing resources because they cannot locate the link and because of this inconsistency in placement. Member Ottusch suggested placing the button further down on the homepage and link to the Dean of Students page. Members discussed the possibility of placing a student resources link under the resources tab on the homepage and members agreed consistency in location was most important. Members suggested a student resources could be linked under Student Life.

Basic Needs Survey: Chair Ohala shared the survey with the committee and walked through questions, including those from the HOPE center. Ohala added this will go to the ABOR subcommittee on the matter. Committee members provided feedback including: the food insecurity questions lacked follow-up and technology questions were specifically about barriers to technology access. Members also noted the housing questions included items about safe and stable housing. Ohala stated feedback would be sent to Lucas Schalewski and passed onto ABOR.

Classroom Transition: Members discussed the transition back to the classroom, potential difficulties, and if students were being surveyed regarding this issue. Member Ottusch shared CAPS conducts a bi-weekly survey to gather the "pulse" of students. He added that, in the past, the survey showed student modality preferences. He added results from a recent survey showed $35 \%$ of students were somewhat comfortable being in-person and $53 \%$ were somewhat to very uncomfortable being in-person.

## Highlights for April 14, 2021 included:

Basic Needs Coalition: Chair Ohala informed the committee about the status of the ad-hoc group established at the University. The group submitted a proposal for the Provost Investment Fund (PIF) through members Dan McDonald, Lucas Schalewski, and Melanie Hingle, which was funded. Ohala stated the group discussed items that need to be explored and tasks required to establish an official Basic Needs Coalition. She said many of these items fell into the wheelhouse of Bridgette Nobbe from the Campus Pantry and Dani Carrillo from Fostering Success in the Thrive Center. The PIF will allow the group to be involved in higher-order tasks and help with establishing necessary infrastructure including seeking additional, more permanent financial backing.

Basic Needs Survey Status: Chair Ohala informed the committee members the survey was sent out in early March and closed in mid-March. She discussed the dashboard information shared with the committee. Questions from the HOPE survey were included and Ohala provided information on actions taken by each of the Arizona universities. She added that ultimately it will be possible to look across efforts at all three of the Arizona universities to find points of alignment and improvement. Ohala added that Student Regent Rusk said the Basic Needs Coalition would meet during the first week of May and he was hopeful Regent DuVal would attend. The focus of this meeting will be recommended policies and practices.

Ohala noted that the Basic Needs Coalition wanted to know, among many other things, what was not being addressed by the survey and that it would hopefully be sent out multiple times to survey students at the beginning and ends of their student careers. She added that other members of this committee wanted
to know if food security was tied to GPA and/or retention rates as these were metrics ABOR was focused on. Committee member Ottusch shared data from the 2018 campus health survey that indicated food insecurity predicted lower GPA. Committee member Stone expressed the need to add the question: at what point did you experience food insecurity and at what level did it happen? Members expressed that number of semesters at the University may be a better measure of class standing than status as freshman, sophomore, etc.

Homepage-Student Resources Issue: Chair Ohala spoke again to Provost Folks regarding placing student resource information in a prominent location on the University's homepage. She was directed to another source who may be able to help with this task. Currently, resources are located under the COVID area of the UA homepage but Ohala shared the committee's suggestions about permanent and consistent placement of a resources link, particular as students need access to resources at all times not just under pandemic-related conditions. Relatedly, the committee members discussed the issue of students who report a lack of basic needs not using resources because they are unaware the resources are available or don't know how to access them. Committee Members again discussed the issue of where students receive information regarding food insecurity assistance and benefits. Member Stone asked if the information is shared during orientation and the committee then discussed the pros and cons of doing so as well as other ways to communicate this information, opting in favor of saturation (i.e., a variety of strategies and modalities).

Basic Needs Survey: Preliminary Data Review: Committee members reviewed and discussed preliminary data shared by Chair Ohala from the Basic Needs Survey. Resulting discussion including members reviewing how messaging impacts students and how cultural differences may impact responses. Committee member Stone highlighted information from results regarding technology. Member Ding asked if an additional question could be added to determine what types of problems students were encountering, what resources were available to them, and where they went to look for assistance. Members also discussed adding a question aimed to discover which campus resources were more heavily used. Members discussed if there was point when this data would be shared broadly to allow colleges, cultural centers, and others to see what is happening with their student population.

## Highlights for May 5, 2021 included:

This meeting is pending at the time of this report. Planned agenda items include additional discussion of data from the recent Basic Needs Survey, which is to include proposals for action strategies, and suggestions for coordination and implementation of same. The committee will also discuss concerns and initiatives to be addressed when meetings resume in Fall 2021.

Respectfully submitted,
Diane Ohala, Ph.D., Linguistics
Chair, SAPC

## REPORT TO FACULTY SENATE

FROM: Student Affairs Policy Committee

DATE: May 3, 2021

ACCOMPLISHMENTS:
-Vetted and suggested edits to questions from the Basic Needs Survey (BNS) prior to its administration in March, specifically those questions relating to student access to technology.
-Continued to actively support and assist in the development of a Basic Needs Coalition at UArizona by providing input on critical issues related to food and housing insecurity, among other high-stakes needs (financial wellness, digital literacy, access to technology, mental and physical health, etc.).
-Assisted PIs of PIF grant to support these continued efforts (PIF was awarded).
-Met to look at preliminary data from the BNS and began to formulate suggestions for additional info needed as well as plans of action in light of this preliminary data.

GOALS:

More of the same!

## NEW ACADEMIC UNIT - APPROVAL REQUEST

I. Campus and Location Offering - indicate by highlighting in yellow the campus(es) and location(s) where this academic unit will reside.

| UA South Campus | UA Main | Phoenix Biomedical Campus |
| :---: | :---: | :---: |
| Sierra Vista | Tucson | Phoenix |
| Douglas | UA Downtown |  |
| Mesa |  | Distance Campus |
| Pima CC East |  | Chandler |
| Pinal County |  | Paradise Valley |
| Santa Cruz |  | Yuma |
| UA Science and Tech Park |  |  |
| II. Academic College-Provide the name of the academic college where this unit will be housed. |  |  |
| UArizona Minerals: School of Mining Engineering and Mineral Resources |  |  |
| College of Science and College of Engineering (equal partners) |  |  |
| III. Purpose and Activities of the Unit |  |  |
| Executive Summary: |  |  |
| The Challenge and |  |  |

- Responsible and sustainable production and use of mineral resources underpins modern civilization and healthy communities.
- Demand for mineral resources and mining talent is on the rise. Demand for both increased production and recycling are driven by global population growth, economic development, and shift to low carbon economy. Demand for copper could grow 200\% by 2050 due to renewable energy alone ${ }^{1}$.
- Arizona is a critical, global player in mineral resources and mining with world-class ore deposits, operating mines and mining technology companies. Arizona is the largest copper producer in the US, producing $68 \%$ of the nation's copper, and is the 6th largest copper producer in the world. Arizona ranks 2 nd in the US for non-fuel mineral production overall ${ }^{2}$.
- There is a widening gap between the talent and innovation needed, and what universities provide. Mining and minerals skills of the future are broader and more sophisticated, requiring curriculum refresh, interdisciplinary programming, and attracting a broader range of disciplines to apply their talent to mining and minerals.
- While demand for talent is on the rise, the list of universities that provide mining and minerals talent is shrinking. With the shift in commodities demand, many mining programs in 'coal country' have been hard hit and unable to survive (programs tend to be tied to what's mined nearby). UArizona is among the few operating from a position of strength.
- UArizona is uniquely positioned to be a global leader in sustainable mining and use of mineral resources. By virtue of expertise, breadth, location, and partners. UArizona could develop a global reputation as a leading provider of talent and innovation for 'Climate Smart Mining'3.
- But a new model is needed to realize our potential. Siloes - disciplinary or organizational, are widely recognized as standing in the way of achieving the sea change needed. Multiple stakeholders and partners see the need and support the creation of a new transdisciplinary, collaborative approach to minerals education and innovation.
- The time is now. The importance of minerals is increasing, demand for a new kind of talent that few can provide is rising. UArizona + Arizona's mining and minerals ecosystem has what it takes.


## Proposed Solution: a new interdisciplinary School

Local strength, global impact.
Breaking down siloes between existing programs and extending integration and interaction to other programs like business, social and environmental sciences, and rallying students and faculty around a real-world challenge rather than a single discipline, could not only improve the sustainability and competitiveness of each individual program, but also improve the quality of education, increase research output, bring visibility to an important topic and enhance the student experience.

At a faculty and researcher briefing \& feedback session held in January 2021, 86\% of responders agreed or strongly agreed that this is an important initiative for UArizona, and $83 \%$ of responders agreed or strongly agreed they would like to participate in this initiative.

Our Mission: We transform the way students, professionals, and communities work across boundaries to meet the complex challenges of economically, socially, and environmentally sustainable mineral resources.

## Program areas:

- Partnerships and Networks. Connecting people - across campus and around the world. Increase collaboration across campus, with other universities, industry, NGOs, and communities; develop a global network of experts.
- Curricular Innovation \& Global Access. Creating a dynamic, holistic, and integrated education experience for lifelong learning, from undergraduate to professional, in Arizona and globally accessible.
- Research and Innovation Hub. Stimulating collaborative, interdisciplinary research to become the go-to expert and solutions provider and preferred research partner for important issues like water and energy optimization; tailings management; social, environmental, and governance; and application of AI and analytics.
- Student Success. Helping students navigate mining and minerals education pathways, extracurricular activities, and connecting those to career options and opportunities.
- Community Outreach and Engagement. Increasing mineral resources literacy among K-12 teachers and students, and the public, to promote related studies and produce informed natural resources consumers.


## Measuring Success:

- Students: enrollment, support, and completions
- Research: expenditures, proposals, papers
- Reputation: ranking, visibility (media)
- Partnerships: external organizations, faculty affiliation


## TA The University <br> 노. Of ARIZONA

- Funding: state, federal agencies, industry, philanthropy (diversified sources)


## Key Financials:

Startup (year 0):

- Received: \$3M philanthropy endowment, \$1M philanthropy expendable capital
- Committed: $\$ 4 \mathrm{M}$ philanthropy expendable capital (signed gift agreements in place)
- Requested: \$4M state (one-time) UArizona’s FY2022 budget "New Economy Initiatives", and Senate Bill 1788.
At year 5:
- Income: \$ 4,385,150; sources: Tuition revenues, research IDC, auxiliary services, philanthropy
- Expense: \$4,136,171; categories: Faculty 42\%, Staff, 24\%, Student support 16\%, Research investment 14\%, Operations 4\%
- The school design allows flexibility to experiment, and scale up or sunset programs based on performance, as well as funding.
A. Identify the basic goals and objectives of the new unit.

Demand for Mineral Resources and Mining talent is on the rise
Demand for mineral resources is increasing due to global population growth, the shift toward clean energy, increasing reliance on technology, and infrastructure development needs, as well as growing concern over securing domestic supply of the mineral resources we rely on every day.

A low-carbon future will be highly mineral intensive because clean energy technologies need more materials than fossil-fuel-based electricity generation technologies. Graphite and lithium demand are so high that current production would need to ramp up by as much as 500 percent by 2050 just to meet demand ${ }^{4}$. Copper is required for every major green energy technology, as well as storage and power transmission. Beyond energy, mineral resources are also required for other rapidly expanding technologies like medical devices, computing and communications networks, transportation, and manufacturing. Sand and gravel are needed to make the concrete ubiquitous in infrastructure.

With so many demands for mineral resources, optimizing supply has never been more important. This includes improving the safety and efficiency and reducing negative environmental and social impacts of primary production (mining), as well as finding new methods of recovering minerals from non-traditional sources (e.g., brines, waste), and overall innovation regarding how we manage resources, how we make and use products, and what we do with the materials afterwards (recycling and circular economy). It is important to note that while advancing the recycling and reuse of minerals can play an important role in meeting demand, mining will still be required to supply critical minerals needed so there is a need to meet remaining primary demand in the most effective, and environmentally and socially responsible manner.

Many of the necessary advances to safety, efficiency, and environmental mitigations are expected to come from technological innovations. Advances in use of geothermal and other green energy in operations, electric fleets, autonomous and continuous mining, use of analytics and artificial intelligence to optimize water and energy-intensive mineral processing, even deepsea mining robots that can mine in ways less disruptive to delicate ecosystems are a few recent or in progress mining innovations. Additional potential exists for space mining, recovering minerals from waste, offsetting carbon emissions through geological carbon sequestration, as
well as recycling innovation like Apple's iPhone rare earths recycling robots or recovering cobalt and lithium from spent lithium batteries.

Mineral resources, mining and mining technology are also important to the economic development of the communities that hold the resources, whether in developing nations or right here in Arizona, bringing infrastructure like schools, hospitals, and water treatment facilities to the former (and even in rural US communities), and jobs to both. Ensuring maximum and equitable benefits to communities remains a complex challenge.

## Arizona is a critical, global player in mineral resources and mining

Given growing concerns over security of supply of critical minerals, domestic mining activity is expected to increase. In fact, Arizona was recently ranked $2^{\text {nd }}$ in the world for mining jurisdiction attractiveness ${ }^{5}$, and companies from mineral resources-rich Australia are expanding investment in exploration here in Arizona ${ }^{6}$. Arizona is the largest copper producer in the US, producing $68 \%$ of the nation's copper, and is the $6^{\text {th }}$ largest copper producer in the world. Arizona ranks $2^{\text {nd }}$ in the US for non-fuel mineral production overall ${ }^{7}$.

With so much at stake globally and here, in Arizona, it only makes sense that many of the advances required to ensure the workforce and innovation needed for a secure supply of responsibly sourced minerals would come from the University of Arizona.
While UArizona has long been a leader in mining and mineral resources workforce development and innovation, meeting the complex needs of the future requires a whole new level of preparation. Finding and extracting these minerals is growing more complex; the easy deposits have already been mined. Remaining deposits are deeper underground, lower grade ore, and are in difficult locations representing access or geopolitical difficulties, or simply the "not in my backyard" challenges that come with mining closer to communities. There are also growing environmental, social and governance concerns over issues like carbon emissions, wise land use, impact to biodiversity and ecosystem services, water and energy consumption, community health and safety, protection of cultural heritage sites near mine sites, and ethical sourcing. Manufacturers of everything from automobiles to cell phones face pressure from investors and consumers to ensure the materials they use are obtained in an ethical and sustainable way.

There is a widening gap between the talent and innovation needed, and what universities provide Considering these gaps, it is no surprise that workforce is among the top three concerns expressed by global mining industry CEOs and other top industry leadership, according to interviews conducted as part of the discovery phase for the new school (see appendix). Industry interviews coupled with studies commissioned by industry bodies such as Minerals Council Australia and conducted by management consulting firms including Ernst and Young, and Deloitte, as well as articles and publications citing interviews with faculty from global minerals programs were consistent in their conclusions:


Fig. 1: Mining and Mineral Resources Skills of the Future are Broader and More Sophisticated
(1) Mining skills of the future are broader and more sophisticated, requiring more data, systems, social, complex problem solving, and resource management skills IN ADDITION TO traditional technical skills
(2) There is a perceived widening gap between industry and academia, with universities often seen as operating in isolation
(3) Mining curriculum is seen as outdated, and too narrow, failing to incorporate the latest technology, or emerging critical issues like environmental and social aspects
(4) Research is often seen as irrelevant, or takes too long (not practical to apply, or it is obsolete by the time it is finished)
(5) Minerals programs fail to attract the very best talent, and are currently facing critically low enrolments globally, with workforce shortages projected
(6) Finally, siloization and a lack of diversity in the workplace (in both disciplines and demographics) is not only hindering progress and innovation $\backslash$ but is considered a threat. The industry is seeking diverse talent that can work and communicate across boundaries, with critical thinking skills and an appreciation for systems thinking to solve the complex problems of the future.

While interviews and studies largely covered industry (exploration, mine operators, supply-chain and consultancies) concerns, regulation and policymaking with respect to mineral resources are facing similar challenges and require the same investment in educational support. Likewise, ensuring sustainability of mineral resources relies not just on those who supply, regulate, and govern, but also the public. As such, it is equally important to engage with the public about limited natural resources and sustainability in a way that is relevant to their daily lives and that they can translate into personal decision making, so that they may become informed users of the resources they consume.

The list of universities that provide mining and minerals talent is shrinking
At the same time society's needs for mineral resources are increasing, and supply-side challenges are becoming more complex, the university programs that provide the talent and innovation needed to tackle these challenges and meet these needs are in decline. Mining Engineering programs in the US have halved since the 1980's and programs continue to close globally, with two of Australia's leading programs set to close this year. A 2018 study commissioned by Minerals Council Australia (MCA) warned of impending closures, "There is a genuine threat of program closure because of critically low enrolment levels in programs, which are also ... high cost to universities to run. ${ }^{8}$ This is a global phenomenon. Enrollments typically fluctuate with the commodities cycle, and many programs struggle to survive downturns such as the current one where enrollments in Australia, Canada and the US are down $50 \%$ or more from their respective peaks ${ }^{9}$. At the same time enrollment in Australian mining engineering programs was dropping, employment in the sector rose over $20 \%{ }^{10}$. The same 2018 study by MCA predicted that by 2020, Australia would have only $25 \%$ of the mining engineers it needed meet existing project needs. The exception to declining mining engineering enrollment trends appears to be China University of Mining and Technology, which has more students enrolled in its mining engineering program than all US universities combined ${ }^{11}$.

Small, but important programs like those that are related to mining and mineral resources are constantly at risk, and often lack the resources they need to modernize their programs or improve visibility and recruitment.

## UArizona Mining and Minerals: Current State

Currently, UArizona offers the following mining and mineral resources specific degrees:

Mining Engineering BS
Mining, Geological, and Geophysical Engineering MSc, ME, PhD
Economic Geology MSc, PSM, PhD
Mining Law and Policy Concentration LLM, MLS
Currently, these programs operate largely independently of each other, with limited integration or interaction. This represents both a missed opportunity, and a risk. Currently, the courses and advising needed to attract students from important disciplines like hydrology, economics, data science and other engineering disciplines to mining and minerals related studies are not available.

Also, with such limited and targeted programs, most UArizona students do not get the opportunity to engage with the subject of mineral resources and mining and are therefore not well informed about the materials they use every day and how they are obtained, or related education and career opportunities.

According to a UArizona study conducted on UArizona students ${ }^{12}$ :

- 72 percent agree mineral resources are important to their daily lives
- 74 percent are aware Arizona has active mines
- 66 percent are aware UArizona offers a Mining Engineering degree
- 67 percent say they know little to nothing about mining

A further study focused on UArizona freshmen engineering students ${ }^{13}$ revealed that incoming students knew the least about mining engineering when compared to the 14 other majors they
could choose from. Correspondingly, they found it "very uninteresting." Overall, the study found a very strong correlation between knowledge of a subject and interest in the subject. After a 20minute presentation on mining engineering, knowledge increased by 70 percent and interest tripled. Students will not choose to study something they know nothing about.

Similarly, students will not pursue a career in a field they do not know is a possibility for them. Back to the study on UArizona students as a whole, when asked if they were considering a career in the mining industry, about 95 percent said "no." When asked if they would consider a career in mining if one existed in their field of study, more than 60 percent said "yes." The mining and minerals industry employs a very, very wide range of disciplines but the myriad of possible education and career pathways are not well defined and lack visibility.

The problem of lack of awareness starts early. After a presentation on minerals, mining, education, and careers by the Lowell Institute for Mineral Resources' outreach staff, one local high school teacher remarked on a feedback form:
"Students are usually ignorant of what opportunities exist in the academia and, unless the academia reaches out to students, it is difficult for students to learn ahead of time what opportunities for their professional and academic growth exist. This presentation has certainly given motivation to some students to pursue with more determination higher education."

More robust high school and community college outreach has the potential to attract students who otherwise would not have considered higher education at all.

Considering the potential for broad student interest coupled with increasing demand for talent and declining supply, this is an area ripe for development.

## UArizona has what it takes to be a world-leading mining and mineral resources university. But a new model is needed to realize our potential.

The University of Arizona has been a global leader in mining education since 1885, when mining was one of the university's two foundational programs along with agriculture. Today, the university has one of only 12 accredited mining engineering programs in the US and among the only economic geology and mining law programs.

UArizona also has leading programs in other critical disciplines required by mineral resources industries including environmental science, business, data science, social sciences, hydrology, public health, and policy, and a whole host of other engineering disciplines - meaning the UArizona is uniquely placed to cross-pollinate mining knowledge with other critical fields to provide the quality, depth and breadth of talent needed.

No other university in the US with an accredited mining engineering program has UArizona's proximity to world-class operating mines, ore deposits, and leaders in mining technology, and UArizona's industry partnerships are second to none.

Additionally, UArizona has created and sustained successful proof-of-concept interdisciplinary education programs including the Global Mining Law program, and interdisciplinary research centers such as Center for Environmentally Sustainable Mining, and other highly specialized,
solutions-oriented programs like the Geotechnical Center of Excellence.

Yet something is standing in our way. In a workshop with 10 faculty engaged in putting together this proposal, the current state of mining and mineral resources education at UArizona was described as siloed and unable to attract the quality or diversity of students needed. Research fared better, but still the group felt UArizona is not leveraging existing strengths to nearly its potential. Overall, the group felt a shared mission and goals, clear roadmap and dedicated leadership, and a more robust integrative framework and academic program support is needed to achieve the scope and scale of change required, and to sustain it.

Breaking down siloes between existing programs and extending integration and interaction to other programs like business, social and environmental sciences, rallying students and faculty around a real-world challenge rather than a single discipline, could not only improve the sustainability and competitiveness of each individual program, but also improve the quality of education, increase research output, bring visibility to an important topic and enhance the student experience.

Now is the time to connect and integrate UArizona's disparate mining and minerals programs into something truly world leading.

## The School of Mining Engineering and Mineral Resources

Our Mission: We transform the way students, professionals, and communities work across boundaries to meet the complex challenges of economically, socially, and environmentally sustainable mineral resources.

## Our Goals:

(1) Elevate the status and quality of mineral resources related studies and research to something the best students and faculty want to (are proud to) be a part of.

This will help us broaden the aperture of students, faculty and researchers who choose to become involved in the grand challenge of responsibly and sustainably supplying mineral resources. It will also help us attract higher caliber talent.
(2) Provide transdisciplinary, integrated education and research about sustainable mineral resource development and stewardship, covering the entire mining and mineral resources lifecycles.

Integrated, dynamic, and holistic. Unconstrained by traditional disciplines, the school will take an issue-centric approach to providing the mineral resources workforce and innovation of the future.
(3) Form world-class strategic partnerships to leverage the talent of global experts across industry, academia, NGOs, and governments.

We need to bring people together, providing the leadership and resources to build an international network of experts on mineral resources sustainability.
(4) Be a thought leader and a change agent on important issues to positively impact the way mining happens, improving economic, environmental, and social performance.

Be the go-to on issues pertaining to sustainability of mineral resources. As industry expressed it, "bring the new thinking" - but also create the talent capable of working across boundaries to influence and implement complex change.

B Describe the activities, projects, and programs that will be conducted by the new unit.
The new school is designed to provide an integrated, cohesive student experience and enhanced support for students, researchers and faculty pursuing mining and mineral resources related studies and research.

The school has five main program areas:

1. Partnerships and Networks
2. Curricular Innovation \& Global Access
3. Research and Innovation Hub
4. Student Success
5. Community Outreach and Engagement

The school will also offer new academic programs. The intention of these new programs is to reach new audiences, create new interdisciplinary offerings, and improve accessibility.

The school will offer undergraduate, graduate, and professional development courses. Academic programs will not replace or duplicate existing degrees or programs, rather courses and curricula offered by the school will:
a) Complement current offerings through inter/transdisciplinary programs and modules that also incorporate in-demand soft skills and experiential learning
b) Address emerging needs of an inter/transdisciplinary nature that would be difficult or impossible for a single department to offer
c) Develop specific, industry or government agency requested professional development coursework that existing departments do not have the expertise, resources, or interest to develop.

We anticipate that, within the first 5 years, the School would offer:

- At the undergraduate level: 1 new introductory course, 1 transdisciplinary minor including 5 new courses, 3 certificates
- At the graduate level: 1 new introductory course, 1 transdisciplinary minor including 3 new courses, 5 new certificates, and 1 GIDP
- 12 new professional development courses
- And 12-15 "modules" to be incorporated into existing courses at the undergraduate and graduate levels.

Above subject to market demand, and approval by required parties. We anticipate submitting our first academic program proposals in Fall 2021.

Additionally, the school will support curricular innovation in existing departments offering mineral resources related degrees or courses via support services for member, associate, and affiliated faculty.

Our target audiences for academic programs include all of the following:

## Who impacts mineral resources availability?

People who are working, or will work in various roles in public and private sector, as well as the general public.


A high-level description for program areas and academic programs follows.

## (1) Partnerships and Networks

$\left.\begin{array}{|l|l|}\hline \text { Objective: } & \begin{array}{l}\text { Connecting people - across campus and around the world. } \\ \text { Increase collaboration across campus, with other universities, industry, } \\ \text { NGOs and communities; develop a global network of experts }\end{array} \\ \hline \text { Activities: } & \begin{array}{l}\text { Faculty and Researcher Connect: } \\ \text { The School will serve to connect and communicate with faculty and } \\ \text { researchers on a regular basis and as needed in order to: } \\ \bullet \\ \text { Educate and engage a broader group of faculty on education and } \\ \text { research opportunities around mining and mineral resources, both } \\ \text { at UA and around the world }\end{array} \\ \bullet \quad \begin{array}{l}\text { Provide a forum for exchanging information and ideas } \\ \text { - Provide opportunities and a platform for showcasing and } \\ \text { communicating success stories in education and research } \\ \text { Create a global network of experts }\end{array} \\ \text { The School will organize summits and events that bring people together } \\ \text { (detail follows), help to monitor and curate internal and external events of } \\ \text { interest, research opportunities, contests, and to communicate via } \\ \text { department and proprietary listserv(s), website, newsletter, relevant }\end{array}\right]$
association, society and industry media, and social media. The School will maintain an online, searchable faculty and researcher directory.

Strategic Partnerships:
The School will proactively work to identify, establish, build, and maintain targeted relationships with industry, academia, NGOs, governments, and communities to further the mission of the School, specifically to:

- Secure internships, cooperative education, and research opportunities
- Deliver timely and relevant solutions to complex stakeholder challenges
- Identify needs, interests, and value propositions for development of specific programs, proposals, and agreements
- Expand the School's reach, influence, and improve visibility
- Secure financial support


## (2) Curricular Innovation and Global Access

| Objective: | Creating a dynamic, holistic, and integrated education experience for lifelong learning. <br> Prepare students and professionals with the breadth and depth of knowledge, skills and abilities needed in the future. <br> Additionally, with the number of mining programs shrinking around the globe, this presents a unique opportunity for online and distance learning. |
| :---: | :---: |
| Activities: | The school will provide expertise and/or coordination support to member and affiliated faculty to complement existing degrees with interdisciplinary programs for knowledge and skills needed in the future, providing tools and resources needed to enable inter/ transdisciplinary education, best practices in instructional design and teaching, experiential learning. Specifically, <br> - Monitor's student and stakeholder needs, update and improve existing courses and creating new offerings <br> - Creates adaptive education pathways for students and professionals. Ensures new curriculum is successfully mapped to the student journey <br> - Provides a new course development and course revision framework (methodology), expert resources (instructional designers, etc.), and financial compensation to ensure schoolaffiliated curriculum is developed and maintained to the highest standards <br> - Works with member and affiliated faculty and identified subject matter experts both to develop modular content and to integrate the content into existing coursework (for example, integrating a case-based data science exercise into a reclamation course); engages world-wide subject matter experts. |

- Adapts or develops courses for specific international audiences and needs
- Ensures development and maintenance framework integrates external stakeholder (industry, govt agency) input
- Ensures maintenance framework successfully integrates latest research
- Provides regular assessment and quality assurance


## Academic Programs

Introdu
General
Educat
(under
and grad
levels)
(3 units)

Purpose: introduce a wide range of students to the topic of mineral resources, raise interest in pursuing studies in related fields (like majoring in mining engineering) and/or enrolling in the transdisciplinary minor. Improve natural resources literacy and create a generation of informed resource users. Could be part of a natural resources or sustainable development series to increase reach.

The school will offer both an undergraduate, and graduate level course under its own prefix.

Description: Entry level course that contextualizes mineral resources what they are used for and questions of consumption, how they are acquired and challenges around traditional and new methods of production/acquisition, manufacturing, and recycling (future focused).
(1) Mineral resources and their uses, consumption patterns and growing demand, current and future supply mix (production, recycling)
(2) Where minerals happen and how we find them, responsible exploration considerations
(3) Should we mine here?: assessing impacts to environment, social (health, culture and economic), resource economics, geopolitical and regulatory issues, and the economics of the feasibility study
(4) How do we mine here?: difficulties due to nature of deposits, types of mines, processing, considerations in mine design, power and water, safety \& workforce, digitization \& workforce
(5) What do we leave behind?: Reclamation, closure \& repurposing, community sustainability
(6) Manufacturing, recycling, and the circular economy: opportunities and challenges

Optional companion course/activity: (undergraduate) Teaching GEOS 397a with education outreach project, offering UA students the opportunity to share what they know with K-12 students and the public

This course content will be adapted for:

- Individual modules for integration into other courses
- General public, including K-12

Transdisciplinary $\quad$ Purpose: The minor is designed to attract a diverse range of students

Minor
(undergraduate and graduate levels)
(18 units)
(diverse in terms of both demographics and disciplines) to broaden the aperture of who engages in mineral resources related studies. The minor will build on the introductory / general education course and provide students both holistic context and an opportunity to dive deeper into areas of interest (technical, social, environmental, economic) to complement their degree focus. The minor strives to bring diverse students together to learn to collaborate, problem solve, and communicate with people with different knowledge and perspectives. Ideally, experience with the minor will inspire students to study related topics at depth and explore career opportunities in natural resource development. The minor is envisioned to provide flexible options.

The school will offer both an undergraduate and graduate level minor.
The minor will consist of new and existing courses:
at least 12 units across 3 different disciplines (largely existing courses in year 1). Some of the courses will be newly developed and owned by the School. Others will be existing courses offered by other departments.

For example, an undergraduate economics student may choose to take:

- Resources and Environmental Economics (AREC217)
- Ecosystem Health and Justice (ENVS310)
- Mine Examination and Valuation (MNE430)
- The Economics and Social Connections to Natural Resources (RNR485)
+3 unit experiential learning: (a) Internship or Cooperative education, or (b) Research project or research cooperative, or (c) community engagement or outreach (d) study or intern abroad
+3 unit capstone: course (or) individual thesis-type project
The capstone course will challenge students to work as a team to apply their knowledge, communications and presentation skills, analytics skills, and appreciation for diverse issues and talent on a project demonstrating an understanding of the technical, social, environmental, and economic aspects of the problem.

The capstone thesis project will be an individual research project that demonstrates synthesis of multiple disciplines to solve a problem.

Certificates will generally serve to provide breadth and context, or targeted topical specialization. Areas currently identified for development include:

- Interdisciplinary Mineral Resources
- Environment, Social, and Governance
- Mining policy and law
- Application of AI, Analytics and Automation in Mine Operations and/or Mineral Processing
- Mine Safety and Health
- Continuing education Mineral Resources for K-12 educators

The school aims to offer 3-5 new certificate programs at each level over the first 5 years.

This course content may be adapted for:

- Standalone modules or for integration into other courses

| Graduate <br> Degrees | Likely not until year 3, options under consideration include: <br> - Sustainable resources development GIDP <br> Mineral resources MBA |
| :--- | :--- |
| Professional <br> Development | While not academic, this represents a lucrative opportunity to create <br> industry-focused, targeted, and accessible programs that will also be <br> attractive to students looking to gain a competitive advantage. <br> Short courses, field courses and (as mentioned above) certificates are <br> attractive options for employers. <br> Being the educator of choice for the mining industry can lead to valuable <br> partnerships and funding opportunities. |

## (3) Research and Innovation Hub

$\left.\left.\left.\begin{array}{|l|l|}\hline \text { Objectives: } & \begin{array}{l}\text { Stimulating collaborative research that could change our world } \\ \text { Increase inter/transdisciplinary research, increase scope of awards, } \\ \text { increase research with external partners }\end{array} \\ \hline \text { Activities: } & \begin{array}{l}\text { The school will serve to break down barriers to inter/transdisciplinary } \\ \text { research through: } \\ \text { Summits and Events }\end{array} \\ \text { The School will strive to host at least one large scale, world-class summit } \\ \text { each year. The summit will bring world-leading experts and diverse } \\ \text { stakeholders together around themes and should provide opportunities for } \\ \text { showcasing research, sparking ideas, prioritizing issues, and identifying } \\ \text { education and research opportunities, student contest ideas, engaging } \\ \text { students, networking and building relationships. }\end{array}\right\} \begin{array}{l}\text { The School will also organize and host regular research seminars and/or } \\ \text { conferences and other smaller scale and sometimes targeted events with } \\ \text { the purpose of building networks and relations, exchanging ideas across } \\ \text { disciplines, sharing success stories and opportunities. Events will promote } \\ \text { sharing across disciplines, and some will target students with the added } \\ \text { objective of identifying student projects to showcase more broadly. }\end{array}\right\} \begin{array}{l}\text { Projects and Contests for students } \\ \text { The school will organize and host at least one large-scale contest bi- } \\ \text { annually, open to students globally. Contests will be sourced at the annual } \\ \text { summit/event and emphasize interdisciplinary teams. Faculty mentors for }\end{array}\right]$

UA students will be sourced from the school network. Judges will be sourced from global stakeholders. Contest winners will be invited to present at the annual summit/event.

The school will help to curate research projects from strategic partners and establish an online forum for partners to submit project ideas for students. Faculty mentors for students will be sourced from the school network. Students will be eligible to apply for seed-funding through the school.

Incubator / Seed-funding
The incubator is where ideas enter the research and development pipeline. The incubator is meant to attract unconventional research and collaboration ideas, and encourage both students and faculty to engage in futuristic thinking.

An internally competitive funding mechanism will allow faculty and students to put their ideas forward and compete for seed funding that will enable them to complete the exploratory work they need to do to compete for large contracts and grants, or proceed to the Strategic Initiative phase.

- Applications will be reviewed by an internal committee, and external reviewers as needed (but generally recommended to engage others)
- Proposals will be screened for alignment with school scope and then evaluated based on a predefined rubric (e.g. relevance, potential for future funding, partnership development, potential for interdisciplinary); protocols will be tiered according to award size
- Awards will range from a few thousand dollars to \$100,000
- Recipients will be required to present at school research seminars, annual summit, and a minimum of relevant conferences, as well as publish
- Awardees will be eligible for mentorship from a member of the school's committee or affiliated faculty/researchers
- A modified version of above will apply to students

In addition to seed funding, the incubator will run regular (annual or semiannual) workshops to help faculty/researchers learn how to create a successful mining or mineral resources proposal. Workshops will feature key guests from important funding agencies like NSF program coordinators/managers.

## Strategic Research Initiatives

Provide faculty and researchers with the support necessary to develop interdisciplinary research ideas into areas of expertise where UA will be considered a go-to expert and solutions provider, and preferred research partner for important topics like water and energy optimization; tailings management; social, environmental, and governance; and application of AI
and analytics. This approach builds on the Lowell Institute's experience establishing programs such as Geotechnical Center of Excellence.

Specifically, to aid in the informed, continued development of the academic programs and to inform interested partners (universities, industry), we propose to pursue a mining and minerals workforce intelligence initiative, to better assess and monitor developing workforce trends and translate those into solutions. There is a significant intelligence gap in this space in the US. UArizona could become the national leader.

There are two routes to a funded SRI:
(1) An outside funder brings significant resources to the table

- Projects must align with School scope and mission
- Projects will be evaluated by committee to evaluate above and feasibility
(2) A seed-funded project matures to a stage where it can demonstrate significant potential to:
- Source its own funding through federal or state grants, industry projects/consortia/memberships/course revenues (becoming selfsupporting in 3-5 years)
- Develop a strategic partnership(s) or collaboration
- Deliver an important product or solution
- Applications will be reviewed by an internal committee, and external reviewers as needed (but generally recommended to engage others)
- Proposals will be screened for alignment with school scope and then evaluated based on a predefined rubric based on above.
Strategic Research Initiatives are expected to:
- Develop courses and integrate research findings into existing coursework
- Hire and mentor graduate students to help with research and teaching, and engage undergraduate students
- Engage with other universities, industry, government, and the community
- Present at school research seminars, annual summit, and a minimum of relevant conferences as well as publish
- Source diversified funding to become financially self-supporting within 3-5 years
- Report against KPIs semi-annually

| (4) Student Success |  |
| :--- | :--- |
| Objectives: | Helping students navigate options and connecting them with opportunities <br> and people that could change their lives. <br> Attract more students, more diverse students, and better students. Help <br> students achieve the mineral resources career placement of their choice by <br> becoming the educator of choice. |

Activities:
This program area will help to connect students to the 4 other program areas. The school will provide a new level of "connected advising" to help students:

- Discover mineral resources related studies and opportunities
- Navigate and customize education options and pathways
- Connect education pathways with career options
- Connect with internships, research projects, study abroad, scholarships, and people
These services aim to support students who seek to maximize their college education opportunities, as well as provide that extra level of navigation assistance especially important to first generation and underrepresented students. A dedicated staff resource, as well as Core Member faculty will share responsibility for connected advising. Strategic partnerships can help connect students with industry and other professional mentors.

Through our programs, future collaborative space and advisory network, we seek to create a cohesive yet diverse student community, connected by the common, challenging experience fostered by the school.

Provision of scholarships and fellowships to attract the best students is included in the budget.

## (5) Outreach and Engagement

| Objectives: | Increase mineral resources literacy among K-12 teachers and students, and the public |
| :---: | :---: |
| Activities: | Building off the Lowell Institute's existing minerals outreach education model and collaborating with other outreach on campus, the school will: <br> - Partner to help develop, coordinate, and deliver engaging age \& curriculum-appropriate outreach in classrooms, online and in other venues including civic organizations <br> - Advance education through online K-12 education and creation of other materials with an Arizona focus but with national to global potential <br> - Promote active (non-instructional) engagement through citizen science and similar means; potentially at all levels/groups <br> - Work with and leverage other partners (e.g., foundations, museums, societies) to advance minerals understanding <br> - Interact with and support educators (K-12, community colleges, other universities) to meet their needs; to influence curricula at state and national levels <br> - Integrate education outreach with scholarship and fellowship opportunities to encourage students to engage in education outreach with K-12 teachers and students <br> - Develop continuing education opportunities for $\mathrm{K}-12$ teachers <br> - Adapt general education curriculum for the public through a speaker series |

Describe demonstrable partnerships and partnership support that arise from the creation of the unit.
Through support offered through the partnerships and networks framework, we expect to achieve closer partnerships with external partners, specifically:

- A Technical Advisory Committee comprised of members from industry, other universities, government agencies and NGOs will engage regularly to keep the school connected with stakeholders, providing guidance and expertise
- The school will actively identify high-value potential strategic partners and pursue relationships, financial and non-financial in nature; strategic partners may contribute expertise, research projects, internships, scholarships, and other financial support; strategic partners may be industry, government, other university, or NGOs
- Specifically, Strategic Research Initiatives like Environment, Social and Governance, or Analytics, Al and Automation have the potential to bring in industry sponsored memberships or contracts in the same manner as the existing Geotechnical Center of Excellence, and the Center for Environmentally Sustainable Mining. Pursuing program areas aligned with industry and other stakeholder interests will not only keep the school connected but funded.
- Having dedicated resources to develop partnership opportunities will allow us to monetize existing opportunities that we are currently unable to pursue, such as building out a comprehensive in-house professional training program for a major mining company (similar in scale to Caterpillar's Mining 360).
D. How does formal creation of this unit directly promote the fostering of collaborative and synergistic research and outreach beyond what is already happening on campus with existing entities?
Through the partnerships and networks framework, and the research and innovation hub, the school will serve to break down barriers to mineral resources related inter/transdisciplinary research by and to:
- Bring people together to ideate through seminars, summits, and events
- Communicate opportunities and success stories
- Competitive seed funding for students, faculty, and researchers
- Competitive funding and program management support for strategic research initiatives
- Incentives for collaboration with internal and external partners
- Contests and projects for students

Currently, the Lowell Institute runs minerals education outreach with K-12 students. By improving connective support through the school, education outreach could expand to integrate and promote other, related UArizona outreach in areas like College of Science earth sciences (GEOS and HAS), water (Water Resources Research Center), indigenous peoples and health in mining communities (Superfund/ENVS), Policy and Law (Natural Resources Users Law and Policy Center), Arizona Geological Survey, and The Gem and Mineral Museum.
E. Alignment of the proposed unit's purpose to the reporting unit and the University's strategic goals.

Pillar 1: The Wildcat Journey
Driving Student Success for a Rapidly Changing World

Through our student success framework, in conjunction with curricular innovation, the school is committed to providing students with accessible and adaptive education pathways, innovative and relevant curriculum, and arming students with the skills employers value most. The school will also help them navigate options and opportunities to connect with future success. The school also intends to contribute to the new general education curriculum and provide a new collaborative and innovative learning space.

Pillar 2: Grand Challenges
Tackling Critical Problems at the Edges of Human Endeavor
Through our research and innovation hub and curricular innovation frameworks the school will support the dual mandate to expand educational opportunities and address important societal challenges. The grand challenge is meeting the mineral resources needs of a growing population in an economically, socially, and environmentally sustainable way while lifting global living standards and transitioning to a low-carbon economy. This broadly includes aspects of space and the natural environment in a way that will fundamentally shape the future.

Pillar 3: The Arizona Advantage
Driving Social, Cultural, and Economic Impact
Mining is a significant economic driver in the state of Arizona, not only because of the natural resources but also the human capital represented in an exceptional cluster of companies with global reach. But it can be pursued in ways that do not align with social or cultural interests of the communities that hold the mineral resources. The school's draft mission statement: "We transform the way students, professionals and communities work across boundaries to meet the complex challenges of economically, socially, and environmentally sustainable mineral resources." The school will provide the means to incorporate social and cultural issues more holistically into mining and mineral resources related studies. Study abroad programs and community engagement projects can help students develop the social and cultural sensitivity they need to be a positive force in the workplace.

## Pillar 4: Arizona Global

Redefining International and Setting the Standard for a Global University in the Digital Age Through our curricular innovation and global access frameworks, the school will provide online courses to improve global access to mining and mineral resources education particularly in mining jurisdictions. Additionally, through the partnerships and networks framework the school will establish strategic partnerships with oversees universities, particularly in mining jurisdictions, for student and faculty exchange.
F. Documented support from affiliated faculty, department heads, and deans. At the college level, alignment of the proposed unit's goals and objectives to the college's recruitment plan and programmatic priorities.
Attached.

Clear statement of the evaluative criteria to be used in the comprehensive review. How will the proposed unit demonstrate success?

## Pillar/Goal* $\quad$ Metric

Student enrollment

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| Curricular Innovation \& Global Reach / <br> Goal 1, Goal 2 | Course offerings |
| :--- | :--- |
| Research \& Innovation Hub/ Goal 1, Goal <br> 4 | Research expenditures |
|  | Papers |
| Partnerships and Networks / Goal 3 | Proposals |
| Student Success / Goal 4 | Partners (Academia, Industry, Govt agency) |
| Outreach / Goal 1, Goal 4 | Students supported |
|  | Student completion |

## III. Resources

A. Faculty and Staff

1. Provide the name and employee ID of the unit head. new Director - to be hired
2. List the name, rank, highest degree, primary department and estimate of the level of involvement of all current faculty and professional staff who will participate in the new unit. Also, indicate the position each person will hold in the new unit.

The school will use a faculty engagement model similar to GIDPs. In the early years, the school will look to utilize existing faculty to the greatest extent possible, with a limited number of potential strategic hires. Similar to GIDPs, the school will also engage faculty at different levels from across campus. Faculty membership levels are described below:

| Category | Leadership | Instructional | Research |
| :---: | :---: | :---: | :---: |
| [Core] Members: <br> Joint appointments <br> with home department(s) | Director, Assoc. <br> Directors (1.0-0.5 FTE) | Key instructors for school courses (0.2 FTE); Minor / GIDP / Program head (0.4 FTE); educational program directors (0.0-0.2 FTE) | Program/Center <br> Directors; project <br> leaders (0.2-1.0 FTE) |
| Members: actively engaged in school | Internal advisory board members, | Module instructors; capstone participants / leader (0-0.25 FTE); | Pls/co-Pls and others engaged in school / centers research with |

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$\left.$| Category | Leadership | Instructional | Research |
| :--- | :--- | :--- | :--- |
| mission $\pm$ recipients <br> of school support | other standing <br> committee members | certificate leaders (0- <br> 0.25 FTE) | school sponsorship <br> $(0.0-0.5)$ |
| Associate members: <br> interested in school <br> mission, participate <br> intermittently | - | Instructors in non- <br> school (but related) <br> courses; guest <br> lecturers | Pls/co-PIs etc. in <br> school-related <br> research |
| Affiliate members: <br> interested in school <br> mission | - | - | Willing to be listed |
| Professional <br> affiliates: non-UA <br> contributors to <br> School activities | External advisory |  |  |
| board members |  |  |  |$\quad$| DCCs and adjuncts |
| :--- |
| involved in teaching / |
| advising |$\quad$| External co-PIs, DCCs |
| :--- |
| involved | \right\rvert\,

Faculty recruitment is ongoing at this stage. At a faculty and researcher briefing \& feedback session held in January 2021, 83\% of responders agreed or strongly agreed they would like to participate in this initiative.

| Faculty -- Leadership | Position | FTE |
| :--- | :--- | :--- |
| TBD | Assoc. Dir, Curricular Innovation | 0.5 |
| Mark Barton, PhD, Professor <br> GEOS | Assoc. Dir, Lowell Institute | 0.6 |
| Faculty <br> Members/Associates/Affiliates | Name, rank, degree, department |  |
| Core Members | Mark Barton, PhD, Professor GEOS and Assoc. <br> Director, Lowell Institute <br> Moe Momayez, PhD, Professor, and Interim Head <br> MGE* <br> Brad Ross, PhD, Professor of Practice MGE* <br> John Lacy, JD, Adjunct Professor, Law and <br> Director, Global Mining Law Program* <br> Eric Lutz, PhD, Assoc. Director Safety \& Health, <br> Lowell Institute <br> TBH Mine Automation Professor, MGE (new hire <br> in progress) | $0-1.0$ |
| Members | Raina Maier, PhD, Professor, ENVS and Director, <br> Superfund* <br> Julie Nielsen, PhD, Assoc. Research Professor <br> ENVS and Director, CESM* <br> Jeff Burgess, PhD, Assoc. Dean, CoPH* <br> Diane Austin, PhD, Director and Professor, School <br> of Anthropology* | $0-0.5$ |


|  | Phil Pearthree, PhD, Director AZGS* <br> Ty Ferré, PhD, Distinguished Professor, HAS <br> Pete Reiners, PhD, Professor GEOS and Assoc. <br> Dean COS <br> Carson Richardson, PhD, Sr Research Scientist <br> AZGS <br> Monica Ramirez, PhD, Asst. Professor ENVS Isabel <br> Barton, PhD, Asst. Professor MGE <br> Frank Mazdab, PhD, Researcher, GEOS <br> Chad Williams, MSc Geotechnical Engineering, <br> Asst. Director Geotechnical Center of Excellence <br> Jenna White, MBA, Program Manager <br> Environment, Social, and Governance, Lowell <br> Institute <br> TBC Professor, GEOS and Lundin Chair, Economic <br> Geology (new hire in progress) |  |
| :--- | :--- | :--- |
|  | Victor Garcia, PhD, Research Scientist AZGS <br> Alicja Babst-Kostecka, PhD, Asst. Professor ENVS <br> Larry Head, PhD, Professor SIE |  |
| Associate Member |  |  |
| (to be confirmed) | var <br> AffiliatesJaeheon Lee, PhD, Associate Professor MGE <br> Gail Heath, MSc Geophysics, Sr Lecturer MGE <br> John Kemeny, PhD, Professor MGE <br> Kwangmin Kim, PhD, Assistant Professor MGE <br> Victor Tenorio, PhD, Professor of Practice MGE <br> Muhammad Waqas, PhD, Lecturer MGE <br> Jinhong Zhang, PhD, Associate Professor MGE <br> Mike Conway, PhD, Sr Research Scientist AZGS <br> At least 50 more faculty with a track record in <br> mining and minerals to be invited | var |
| Professional Affiliates | Various individuals from Freeport, Newmont, IDS, <br> GroundProbe, BGC, Rio Tinto, and others. | var |

*member of the Lowell Institute's existing advisory board
Current staff who will participate in the new unit are presently with the Lowell Institute.

| Professional Staff |  |  |
| :--- | :--- | :--- |
| Jodi Banta | Program Manager | 1.0 |
| Mario Munoz | Recruitment \& Advising Coordinator | 1.0 |
| Chris Earnest | Education Outreach Coordinator | 1.0 |
| DeeDee DuPlessis | Communications Specialist | 1.0 |
| Pat Waters | Accountant | 1.0 |
| Jenna White | Program Manager, Environment, Social, and Governance | $0.6^{*}$ |

*target to increase to 1.0 in Y0/FY22.
3. List the clerical and support staff positions that will be included in the new unit.
4. Project the number and type of new faculty and staff positions that will be needed by the unit during each of the next three years.

| Faculty (FTE) | Yr1 | Yr2 | Yr3 | Total |
| :--- | :---: | :---: | :---: | :---: |
| Director (nature of appointment TBD) | 1.0 | - | - | 1.0 |
| Members/ Affiliates* | 5.0 | +1.5 | +0.4 | 6.9 |
|  |  |  |  |  |
| Professional Staff (FTE) |  |  |  |  |
| Program Coordinator | 2.0 | - | - | 2.0 |
| Instructional Designer | 1.0 | - | - | 1.0 |

*Not necessarily new hires, just new participants in the School.
B. Physical Facilities and Equipment

1. Provide the Unit address for the new department. Include the following:

Mailing address 1235 E James E Rogers Way
Building Name Mines and Metallurgy
Building \# 12
Room 209
PO Box 210012
Zip Code 85721
Unit phone number (520) 621-2988
2. Identify the physical facilities that will be required for the new unit and indicate whether those facilities are currently available.
The Director and 2 staff hires can be accommodated within the Lowell Institute for Mineral Resources office in Mines Building Rm 209. Meanwhile, a feasibility study is underway to accommodate future growth.
3. List all additional equipment that will be needed during the next five years and the estimated cost.
Nothing beyond computer and telecom equipment is required.
C. Library Resources, Materials, and Supplies

1. Identify any additional library acquisitions that will be needed during the next three years and the estimated cost.
None
2. List any special materials or supplies, other than normal office supplies, that will be required by the new unit.
None
D. Other Information

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1. Identify any implications of the proposed change for regional or programmatic accreditation.
None.
2. Provide any relevant information, not requested above, that will assist reviewers in evaluating this proposed addition.
The school will house the Lowell Institute for Mineral Resources, which currently resides within the College of Science. As such, relevant income, expense, staff and facilities associated with the Lowell Institute are part of the plan, but not all are included in the budget because they are handled separately.

## E. Financing

1. Explain the university's plan for providing adequate financing for the unit. Funding will come from 5 primary sources:
2. Tuition revenues
3. Research IDC
4. Auxiliary Services (continuing and professional development)
5. One-time funding from the state
6. Philanthropy, which will cover the difference between earned income and operating expense on an ongoing basis.
7. Identify potential sources for external funding for the unit.

State. One-time funds have been requested in FY22.
Philanthropy. Nearly $\$ 8 \mathrm{M}$ in one-time and multi-year gifts, including endowment funds, have been raised (received or committed) for the school and its programs from private individuals and corporations. Fundraising is on-going and laid out in (5) below.
Auxiliary services. Professional development courses and membership fees in Strategic Research Initiatives (like consortia) are anticipated to bring in hundreds of thousands of dollars each year. This is based on experience with existing Strategic Research Initiatives.

Advancing mining specifically will help secure continued and increased funding from industry and likely large national agencies. Expanding into circular economy and other supply chain issues like ethical sourcing will open up sources from private foundations, manufacturers and other national agencies, allowing for more diversified funding.
3. If state funds will be used, indicate whether new appropriations will be requested or existing appropriations will be reallocated. If reallocating existing appropriations, indicate where these will be drawn from.
UArizona's FY2022 budget request includes \$4M for "New Economy Initiatives" allocated to the school.

Additionally, Senate Bill 1788 requests $\$ 4 \mathrm{M}$ one-time for development of the new school.
4. Complete the Budget Projection Form, projecting the operating budget for the proposed unit for the next three years.
Attached
5. Estimate the amount of external funds that may be received by the unit during each of the first three years.

| Source | Y0/FY22 | Y1/FY23 | YR2/FY24 | YR3/FY25 |
| :--- | ---: | ---: | ---: | ---: |
| State | $4,000,000$ |  |  |  |
| Auxiliary Services | 420,000 | 630,000 | 730,000 | 730,000 |
| Philanthropy-Cash* | $4,795,000$ | $2,370,000$ | $2,050,000$ | $2,230,000$ |
| Philanthropy- <br> Endowment** | $3,000,000$ | $2,000,000$ | $2,000,000$ | $2,000,000$ |
| Total | $12,215,000$ | $5,000,000$ | $4,880,000$ | $4,960,000$ |

* Annual gifts + endowment income.
**Additions to principal.

6. Provide the unit account number (if previously assigned).

None.
IV. Additional Information --provide any other information not requested above that may be useful in evaluating this proposal.
See Appendix for organization chart, UArizona Design Team, high level job descriptions for new staff, Industry Advisory Committee, and list of Companies and Agencies consulted.
V. Required Signatures

Managing Unit Administrator: David Hahn, Craig M. Berge Dean, College of Engineering (name and title)

Managing Administrator's Signature: $\qquad$ Date: $\qquad$

Managing Unit Administrator: Elliott Cheu, Interim Dean, College of Science (name and title)

Managing Administrator's Signature: $\qquad$ Date: $\qquad$

Dean's Signature: (above)
Date: $\qquad$

All programs that will be offered through distance learning must include the following signature. The signature of approval does not indicate a commitment to invest in this program. Any potential investment agreement is a separate process.

Sarah Wieland, Assistant Vice Provost, Distance Education
Signature: $\qquad$ Date: $\qquad$

Appendix

1. Proposed Organization Chart (Functional)

2. High Level Position Descriptions for New Hires

| Position \& Time | Description |
| :--- | :--- |
| Director (1.0) | Acts as the face of the school-- actively builds internal and external <br> networks of support and engagement, establishes world class <br> connections, builds school reputation, secures diversified funding; <br> responsible for building and overseeing academic, innovation and <br> shared services -- assembles a team of superstars, responsible for <br> financial management of the school; Establishes the School's place <br> in UA ecosystem and connect School to other important <br> programs/opportunities. |
| Associate Dir, Academics (0.5) | A Core faculty member, owner of at least one academic program <br> with extra responsibility to champion faculty membership in the <br> School. Recruits and engages faculty across campus by <br> representing opportunities and supporting resources, leads faculty <br> communications and engagement, strategy and development for <br> academic programs. |
| Program Coordinator, Sr (1.0) | Coordinates with faculty, researchers, and external parties to plan <br> and develop integrated programs, coordinates \& plans <br> administration and operations including policy development. <br> Identifies potential funding opportunities and supports proposal <br> development. Responsible for tracking and reporting program <br> performance. |
| Program Coordinator (1.0) | Supports general meeting and event planning and coordination <br> (including summits, seminars, contests and workshops), <br> communications coordination, online forum support, handles <br> general enquiries from public, faculty, researchers and students. |
| Instructional Designer (1.0) | Facilitates learning through instructional design, curriculum <br> implementation, technology application, and teaching and learning <br> assessment. Creates materials and programs to support and <br> evaluate academic and program objectives, course design and <br> delivery. Provides course design consultation to instructional staff <br> and graduate students. Designs courses and workshops for face-to- <br> face, online, and hybrid delivery. May also provide course support <br> and assistance. |

## 3. UArizona Design Team \& Process

## Executive Committee:

David Hahn, Craig M. Berge Dean, College of Engineering
Elliott Cheu, Interim Dean, College of Science
Mary Poulton, Co-Director, Lowell Institute for Mineral Resources

Upon receipt of the lead gift, the design team's Working Group met at least 1 hour weekly from July 2020-March 2021 to construct the plan for the school, representing over 40 hours of meetings and workshops.

Working Group:

Mark Barton, Geosciences and Lowell Institute for Mineral Resources
Ty Ferré, Hydrology and Atmospheric Sciences
Larry Head, Systems and Industrial Engineering
Jaeheon Lee, Mining \& Geological Engineering
Raina Maier (Alicja Babst-Kostecka), Environmental Science
Moe Momayez, Mining \& Geological Engineering
Monica Ramirez-Andreotta, Environmental Science, Public Health - Community, Environment \&
Policy
Pete Reiners, Geosciences and Associate Dean Research, College of Science
Carson Richardson, Arizona Geological Survey
Brad Ross, Mining \& Geological Engineering

Our Process:

|  | Where are we now? | Where do we want to be? | How do we get there? |  |  |  |  | How do we tell everybody [else] about it? |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \frac{\pi}{\omega} \\ & \stackrel{\omega}{n} \end{aligned}$ | Strengths Weaknesses | Opportunities Threats | Programs <br> Activities <br> Research <br> Partnerships | Org Structure Leadership Governance | Faculty <br> Facilities Equipment | Financing |  <br> Success <br> Metrics | Stakeholder Engagement | Communicatio ns/ Marketing |
|  | Internal assessment | External assessment | What will do to get where we want to go? | What shape will that take? <br> Who will lead? <br> Who will advise? | What resources are required to do what we want? What do those cost? | How will we pay for this? <br> Tuition <br> Research <br> Philanthropy Other? | What are our key result areas? KPIs? | Who do we involve, how during the process | Who do we need to sell this School to? What do they need to see? |
| $\begin{aligned} & \tilde{U} \\ & \text { di } \\ & \text { on } \end{aligned}$ | SWOT analysi | Workshop | Subcommittees Workshop | Meetings | Subcommittees | Subcommittee | Meetings | Subcommitt ee | Subcommittee |
| $\begin{aligned} & \text { n } \\ & 0 \\ & \underline{O} \end{aligned}$ | - Pitchbook <br> - Interviews <br> - Topical briefs <br> - List of UA Min orgs <br> - High level com <br> - SWOT worksh | rals faculty and etitor scan et | - SWOT analysis <br> - Prioritized strategies and activity ideas <br> - Pitchbook <br> - Interviews <br> - Topical briefs <br> - List of UA Minerals faculty and orgs <br> - High level competitor scan <br> - High level market sizing | - Models to replicate (or not) | - The School plan (programs, activities, research) <br> - Bids? | - Expenses <br> - Refined market sizing <br> - Enrollment projections <br> - Research contracts and grants projections <br> - Fundraising projections | - Enrollment projections <br> - Research contracts and grants projections - Other .. (depends on KRAs) | - List of all stakeholders who can influence success or failure | - The School scope of activities etc <br> - Org/ldrship/gov <br> - Resource requirements <br> - Financing <br> - Goals \& metrics |
| $\begin{aligned} & \text { n } \\ & \frac{2}{7} \\ & 0 \end{aligned}$ | - SWOT analysi <br> - Prioritized stra ideas <br> - List of informa | egies and activity <br> on requirements | - (the School! What does it do? How does it work?) <br> - Specific competitor scan <br> - Recommendations for strategic partnerships | - Org Chart <br> - Job Description (Director profile) | - Hiring plan <br> - Equipment and space requirements <br> - One-time and recurring expenses | - Teaching revenues <br> - Research revenues <br> - Other revenues <br> - Philanthropy targets <br> - Sustainable business model | - KRAs, KPIs, and targets | - Stakeholder engagement plan | - Plan for submission for internal approval <br> - Pitch for fundraising |

## IA The University <br> 고. Of ARIZONA

## 4. Industry Advisory Committee

The industry advisory board met 1 hour weekly from July 2019-October 2019 to construct the business case to establish the need for the school and to secure a lead donor.

Sudhanshu Singh, General Manager Caterpillar Resource Industries; Lowell Institute Board of Directors
Steve Trussell, Executive Director Arizona Mining Association and Arizona Rock Products Association; Lowell Institute Board of Directors
Jack Lundin, CEO Bluestone Resources; Lowell Institute Board of Directors \& Mining Engineering Alumnus
Greg Boyce, Former CEO Peabody Energy, Lowell Institute Board of Directors \& Mining Engineering Alumnus
Mark Baker, Principal CheckMark Consulting; Lowell Institute Board of Directors, Mining Engineering Industry Leadership Board
Xavier Ochoa, VP Operations Quintana Minerals; Engineering Industry Leadership Board \& Mining Engineering Alumnus

Faculty participants: Mary Poulton, Professor Emerita Mining Engineering \& Co-Director Lowell Institute; Mark Barton, Professor Geosciences \& Co-Director Lowell Institute; John Kemeny, Department Head Mining Engineering

Additionally, representatives of the following companies and agencies were interviewed between July and October 2019 for their input.

- Anglo-American
- ASARCO
- Bronco Creek Exploration
- Caterpillar
- Denison Mines
- EMX Royalty
- Filo Mining
- Freeport-McMoRan
- Hazen Research Labs
- Hudbay Minerals
- Josemaria Resources
- Lucara Diamond
- Lundin Gold
- Lundin Mining
- Metallurgium Inc
- Modular Mining
- Newmont-Goldcorp
- NGEx Minerals
- Resolution Copper
- Salt River Materials Group
- US Geological Survey

[^1]${ }^{4}$ Hund, K., La Porta, D., Fabregas, T.P., Laing, T., and Drexhage, J., 2020, Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition, The World Bank Group, ClimateSmart Mining Facility (http://pubdocs.worldbank.org/en/961711588875536384/Minerals-for-Climate-Action-The-Mineral-Intensity-of-the-Clean-Energy-Transition.pdf)
${ }^{5}$ Yunis, J., and Aliakbari, E., 2020, Fraser Institute Annual Survey of Mining Companies 2020, Fraser Institute (https:/www.fraserinstitute.org/sites/default/files/annual-survey-of-mining-companies-2020.pdf)
${ }^{6}$ https://www.mining-technology.com/news/pershing-to-acquire-three-new-properties-in-us/ , https://www.mining-technology.com/features/hands-across-the-pacific-australian-miners-look-to-north-america/
${ }^{7}$ Mining Technology, News, 2021, Pershing to acquire three new properties in US, (https://www.mining-technology.com/news/pershing-to-acquire-three-new-properties-in-us/)
${ }^{8}$ Evans, N., 2018, Mining-focused university enrolments and 17-year low, PerthNow (https:www.perthnow.com.au/business/mining/miners-warn-of-skill-shortage-ng-b88750262z)
${ }^{9}$ Roy, J., Wilson, C., Erdiaw-Kwasie, A., and Stuppard, C., 2019, Engineering \& Engineering Technology by the Numbers, 2019. American Society for Engineering Education. (https://ira.asee.org/wp-content/uploads/2020/09/E-ET-bythe-Numbers-2019.pdf).

Roy, J., 2019, Engineering by the Numbers. American Society for Engineering Education. (https://ira.asee.org/wp-content/uploads/2019/07/2018-Engineering-byNumbers-Engineering-Statistics-UPDATED-15-July-2019.pdf).

[^2]

Consolidated Income and Expense Yr0 + Yr1-5

| CONSOLIDATED EXPENSES |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | FTE Yr 5 | Year 0 (FY22) |  | Year 1 (FY23) |  | Year 2 (FY24) |  | Year 3 (FY25) |  | Year 4 (FY26) |  | Year 5 (FY27) |  |
| FACULTY \& STAFF |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Faculty | 10.25 | \$ | 1,084,680 | \$ | 1,418,730 | \$ | 1,572,000 | \$ | 1,678,110 | \$ | 1,721,340 | \$ | 1,760,640 |
| Program management | 4.00 | \$ | 349,661 | \$ | 456,521 | \$ | 456,521 | \$ | 456,521 | \$ | 456,521 | \$ | 456,521 |
| Business office | 2.50 | \$ | 226,007 | \$ | 226,007 | \$ | 226,007 | \$ | 226,007 | \$ | 226,007 | \$ | 226,007 |
| Instructional support | 2.00 | \$ | 129,930 | \$ | 129,930 | \$ | 152,859 | \$ | 152,859 | \$ | 152,859 | \$ | 152,859 |
| Outreach | 2.00 | \$ | 152,859 | \$ | 152,859 | \$ | 152,859 | \$ | 152,859 | \$ | 152,859 | \$ | 152,859 |
| Subtotal faculty \& staff | 20.75 | \$ | 1,943,136 | \$ | 2,384,046 | \$ | 2,560,245 | \$ | 2,666,355 | \$ | 2,709,585 | \$ | 2,748,885 |
| STUDENTS |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Undergraduate | 5.00 | \$ | 18,360 | \$ | 53,360 | \$ | 65,600 | \$ | 65,600 | \$ | 65,600 | \$ | 65,600 |
| Graduate | 35.00 | \$ | 200,000 | \$ | 328,321 | \$ | 417,756 | \$ | 526,634 | \$ | 557,742 | \$ | 573,296 |
| Subtotal students | 40.00 | \$ | 218,360 | \$ | 381,681 | \$ | 483,356 | \$ | 592,234 | \$ | 623,342 | \$ | 638,896 |
| RESEARCH INVESTMENT |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Start up |  | \$ | 990,000 | \$ | 990,000 | \$ | 240,000 | \$ | - | \$ | - | \$ | - |
| Continuing |  | \$ | 350,800 | \$ | 553,700 | \$ | 578,700 | \$ | 578,700 | \$ | 578,700 | \$ | 578,700 |
| Subtotal research |  | \$ | 1,340,800 | \$ | 1,543,700 | \$ | 818,700 | \$ | 578,700 | \$ | 578,700 | \$ | 578,700 |
| OPERATIONS |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Space |  | \$ | 12,595 | \$ | 25,190 | \$ | 25,190 | \$ | 25,190 | \$ | 25,190 | \$ | 25,190 |
| All other |  | \$ | 666,388 | \$ | 159,750 | \$ | 169,500 | \$ | 144,500 | \$ | 144,500 | \$ | 144,500 |
| Subtotal operations |  | \$ | 678,983 | \$ | 184,940 | \$ | 194,690 | \$ | 169,690 | \$ | 169,690 | \$ | 169,690 |
| TOTAL |  | \$ | 4,181,279 | \$ | 4,494,367 | \$ | 4,056,991 | \$ | 4,006,979 | \$ | 4,081,317 | \$ | 4,136,171 |


| CONSOLIDATED GROSS INCOME |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Year 0 (FY22) |  | Year 1 (FY23) |  | Year 2 (FY24) |  | Year 3 (FY25) |  | Year 4 (FY26) |  | Year 5 (FY27) |  |
| Teaching |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Tuition |  | \$ | 120,000 | \$ | 399,050 | \$ | 584,700 | \$ | 873,000 | \$ | 1,083,750 | \$ | 1,192,650 |
| Professional Development |  | \$ | 120,000 | \$ | 180,000 | \$ | 240,000 | \$ | 240,000 | \$ | 240,000 | \$ | 240,000 |
| Teaching subtotal |  | \$ | 240,000 | \$ | 579,050 | \$ | 824,700 | \$ | 1,113,000 | \$ | 1,323,750 | \$ | 1,432,650 |
| Research | rates |  |  |  |  |  |  |  |  |  |  |  |  |
| MTDC total |  | \$ | 675,000 | \$ | 1,450,000 | \$ | 2,075,000 | \$ | 2,075,000 | \$ | 2,075,000 | \$ | 2,075,000 |
| IDC total | 25\% | \$ | 75,000 | \$ | 200,000 | \$ | 325,000 | \$ | 325,000 | \$ | 325,000 | \$ | 325,000 |
| IDC fraction to all units | 50\% | \$ | 337,500 | \$ | 550,000 | \$ | 612,500 | \$ | 612,500 | \$ | 612,500 | \$ | 612,500 |
| IDC to school |  | \$ | 37,500 | \$ | 75,000 | \$ | 112,500 | \$ | 112,500 | \$ | 112,500 | \$ | 112,500 |
| Memberships |  | \$ | 300,000 | \$ | 450,000 | \$ | 450,000 | \$ | 450,000 | \$ | 450,000 | \$ | 450,000 |
| Research all funds |  | \$ | 750,000 | \$ | 1,650,000 | \$ | 2,400,000 | \$ | 2,400,000 | \$ | 2,400,000 | \$ | 2,400,000 |
| IDC+memberships to school |  | \$ | 337,500 | \$ | 525,000 | \$ | 562,500 | \$ | 562,500 | \$ | 562,500 | \$ | 562,500 |
| Philanthropy |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Endowment |  | \$ | 280,000 | \$ | 280,000 | \$ | 360,000 | \$ | 440,000 | \$ | 520,000 | \$ | 600,000 |
| Gifts |  | \$ | 4,515,000 | \$ | 2,090,000 | \$ | 1,690,000 | \$ | 1,790,000 | \$ | 1,790,000 | \$ | 1,790,000 |
| Philanthropy subtotal |  | \$ | 4,795,000 | \$ | 2,370,000 | \$ | 2,050,000 | \$ | 2,230,000 | \$ | 2,310,000 | \$ | 2,390,000 |
| Other sources |  |  |  |  |  |  |  |  |  |  |  |  |  |
| UA |  | \$ | - | \$ | - | \$ | - | \$ | - | \$ | - | \$ | - |
| State |  | \$ | 4,000,000 | \$ | - | \$ | - | \$ | - | \$ | - | \$ | - |
| Other total |  | \$ | 4,000,000 | \$ | - | \$ | - | \$ | - | \$ | - | \$ | - |
| TOTAL |  | \$ | 9,372,500 | \$ | 3,474,050 | \$ | 3,437,200 | \$ | 3,905,500 | \$ | 4,196,250 | \$ | 4,385,150 |
| NET INCOME |  | \$ | 5,191,221 | \$ | $(1,020,317)$ | \$ | $(619,791)$ | \$ | $(101,479)$ | \$ | 114,933 | \$ | 248,979 |



Research Yr 1-5
Year 0 (FY22) Year 1 (FY23) Year 2 (FY24) Year 3 (FY25) Year 4 (FY26) Year 5 (FY27) Comments Amounts Variables
Expenses
Strategic research initiatives (aka centers/programs)
Faculty program leadersip
Faculty salaries
Faculty ERE
Total faculty cost
Additional center investment
Total center cost

Matching / seed funds
Other opportunity (collaborations, workshops etc)
Total Research

|  | 2 | 3 | 3 | 3 | 3 | 3 |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
|  | 1.5 | 2.25 | 2.25 | 2.25 | 2.25 | 2.25 |  |  |
| $\$$ | 180,000 | $\$$ | 270,000 | $\$$ | 270,000 | $\$$ | 270,000 | $\$$ |
|  | 55,800 | $\$$ | 83,700 | $\$$ | 83,700 | $\$$ | 83,700 | $\$$ |
|  | 235,800 | $\$$ | 353,700 | $\$$ | 353,700 | $\$$ | 353,700 | $\$$ |
|  | 353,700 | $\$$ | 270,000 |  |  |  |  |  |
|  | 50,000 | $\$$ | 75,000 | $\$$ | 75,000 | $\$$ | 75,000 | $\$$ |
|  | 285,800 | $\$$ | 428,700 | $\$$ | 428,700 | $\$$ | 428,700 | $\$$ |
|  |  |  |  |  |  |  |  |  |

0.75 faculty per initiativ

120,000 faculty salary
31\% ERE rate
\$ 25,000 per center

100,000 annual match $(50 \% \mathrm{Yr} 0)$
ncome

| Strategic research initiatives (aka centers/programs) |  | 2 |  | 3 |  | 3 |  | 3 |  | 3 |  | 3 number of initiatives |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Memberships (e.g., dedicated gifts) | \$ | 300,000 | \$ | 450,000 | \$ | 450,000 | \$ | 450,000 | \$ | 450,000 | \$ | 450,000 | \$ | 150,000 | Membership per program |
| MTDC | \$ | 300,000 | \$ | 600,000 | \$ | 900,000 | \$ | 900,000 | \$ | 900,000 | \$ | 900,000 | \$ | 300,000 | MTDC per program |
| IDC total | \$ | 75,000 | \$ | 150,000 | \$ | 225,000 | \$ | 225,000 | \$ | 225,000 | \$ | 225,000 |  |  | IDC rate |
| IDC to school | \$ | 37,500 | \$ | 75,000 | \$ | 112,500 | \$ | 112,500 | \$ | 112,500 | \$ | 112,500 |  |  | \% of total IDC returned to school |
| Total strategic research | \$ | 675,000 | \$ | 1,200,000 | \$ | 1,575,000 | \$ | 1,575,000 | \$ | 1,575,000 | \$ | 1,575,000 |  |  |  |
| Total strategic research to school | \$ | 637,500 | \$ | 1,125,000 | \$ | 1,462,500 | \$ | 1,462,500 | \$ | 1,462,500 | \$ | 1,462,500 |  |  |  |

Matching / seed funds

from matching / seed to other

Total Research Income
otal Research IDC
675,000 \$ $1,450,000$ \$ $2,075,000$ \$ 2,075,000 $\$ 2,075,000$ \$ 2,075,000
otal Research Income (to school \& other units)
Total Research IDC + memberships (to school \& other units)

## Net

Totals with $100 \%$ IDC
let Total Income
Net Total with only IDC+memberships (no MTDC)
Net Total to School with only IDC+memberships
Net to initiatives only (centers) with only IDC+memberships

## otals with only returned IDC

Net Total Income
Net Total with only IDC+memberships (no MTDC)
Net Total to School with only IDC+memberships
Net to initiatives only (centers) with only IDC+memberships

| $\$$ | 324,200 | $\$$ | 896,300 | $\$$ | $1,496,300$ | $\$$ | $1,496,300$ | $\$$ | $1,496,300$ | $\$$ | $1,496,300$ |
| :--- | ---: | :--- | ---: | :--- | ---: | :--- | ---: | :--- | ---: | :--- | ---: |
| $\$$ | 24,200 | $\$$ | 96,300 | $\$$ | 196,300 | $\$$ | 196,300 | $\$$ | 196,300 | $\$$ | 196,300 |
| $\$$ | 24,200 | $\$$ | 46,300 | $\$$ | 96,300 | $\$$ | 96,300 | $\$$ | 96,300 | $\$$ | 96,300 |
| $\$$ | 24,200 | $\$$ | 46,300 | $\$$ | 96,300 | $\$$ | 96,300 | $\$$ | 96,300 | $\$$ | 246,300 | other IDC goes to home units


| Income |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Year 0 (FY22) | Year 1 (FY23) | Year 2 (FY24) | Year 3 (FY25) | Year 4 (FY26) | Year 5 (FY27) |  |
| Earned -- TBD |  |  |  |  |  |  |  |
| Tuition (total undergrad + grad; includes online) | 0 | 219,050 | 584,700 | 873,000 | 1,083,750 | 1,192,650 | from Teaching Yr1-5 |
| Professional course revenues | 120,000 | 180,000 | 240,000 | 240,000 | 240,000 | 240,000 | from Teaching Yr1-5 |
| Memberships | 300,000 | 450,000 | 450,000 | 450,000 | 450,000 | 450,000 | from Research Yr1-5 |
| IDC total (all new) | 75,000 | 200,000 | 325,000 | 325,000 | 325,000 | 325,000 | from Research Yr1-5 |
| IDC total (new school programs only) | 75,000 | 150,000 | 225,000 | 225,000 | 225,000 | 225,000 | from Research Yr1-5 |
| IDC return (return to school for new programs only | 37,500 | 75,000 | 112,500 | 112,500 | 112,500 | 112,500 | 50\% from Research Yr1-5 |
| Total Earned | 457,500 | 924,050 | 1,387,200 | 1,675,500 | 1,886,250 | 1,995,150 |  |
| Other |  |  |  |  |  |  |  |
| UA | 0 | 0 | 0 | 0 | 0 | 0 |  |
| State | 4,000,000 | 0 | 0 | 0 | 0 | 0 | Requested |
| Philanthropy (committed, requested, or planned) Endowment income |  |  |  |  |  |  |  |
| Existing endowment | 280,000 | 280,000 | 280,000 | 280,000 | 280,000 | 280,000 |  |
| New endowment | 0 | 0 | 80,000 | 160,000 | 240,000 | 320,000 |  |
| Subtotal: Endowment income | 280,000 | 280,000 | 360,000 | 440,000 | 520,000 | 600,000 |  |
| Gifts |  |  |  |  |  |  |  |
| Committed/Rcvd | 4,015,000 | 490,000 | 490,000 | 90,000 | 90,000 | 90,000 |  |
| Requested | 500,000 | 500,000 | 0 | 0 | 0 | 0 |  |
| Projected | 0 | 1,100,000 | 1,200,000 | 1,700,000 | 1,700,000 | 1,700,000 |  |
| Subtotal: Gifts | 4,515,000 | 2,090,000 | 1,690,000 | 1,790,000 | 1,790,000 | 1,790,000 |  |
| Total Philanthropy | 4,795,000 | 2,370,000 | 2,050,000 | 2,230,000 | 2,310,000 | 2,390,000 |  |
| Total Other | 8,795,000 | 2,370,000 | 2,050,000 | 2,230,000 | 2,310,000 | 2,390,000 |  |
| Total Income | 9,252,500 | 3,294,050 | 3,437,200 | 3,905,500 | 4,196,250 | 4,385,150 |  |
| New Endowment (principal) | 0 | 2,000,000 | 4,000,000 | 6,000,000 | 8,000,000 | 10,000,000 | 2,000,000 principal added/year |
| initial value (subtracted from YrO | philanthropy) |  |  |  |  |  | $4 \%$ rate of return |

College of Science Office of the Dean

March 28, 2021

## To Whom It May Concern,

I am writing in support of the proposed school, UArizona Minerals. This collaborative effort between the College of Science and the College of Engineering will create a transformative entity that will support students, professionals and the broader community in education and research as it relates to mineral resources. A number of departments in the College of Science will contribute to this new School such as Geosciences, Hydrology and Atmospheric Sciences, the Arizona Geological Survey and the Lowell Institute for Mineral Resources. This unique collaboration at the University of Arizona has the potential to lead the world in preparing the next generation of leaders dedicated to the acquisition and utilization of mineral resources. We are both proud and excited to be founding members of this new institution, and expect that the collaboration will grow to include a significant number of units throughout the University of Arizona. Already excitement is building around this new School, with many leaders in industry stepping up to support this effort. This is an ideal time to jumpstart this effort, and the proposed new School has the expertise deliver upon its mission.

I fully support the creation of this new School of UArizona Minerals, and expect that it will become the premier institution devoted to mineral resources.

Best regards,


Elliott Chew, Ph.D.
Interim Dean, College of Science
Distinguished Professor of Physics

Thursday March 18, 2021

To whom it may concern,
On behalf of the faculty and staff in the Department of Mining and Geological Engineering, I am writing to express my enthusiastic support for the establishment of the School of Mining Engineering and Mineral Resources. I have been involved in the discussions and planning meetings ever since President Robbins proposed the idea of a 'School of Mines' for the first time to Greg Boyce, Chairman of the Board of the Lowell Institute for Mineral Resources.

All parties involved agree that the School would bring together faculty, departments, colleges, and units on campus and would act as a catalyst to address technical, environmental, and societal challenges related to the supply of critical minerals and the threats to their supply chains. All the faculty and students on campus who study topics associated with the life cycle of a mine, from exploration to mining law, social license, sustainable development, mine construction, mine production, environment, reclamation, safety and health, and beyond (for example space mining) will benefit from the creation of the School, as it will enhance the national and international reputation of the University of Arizona and the Department of Mining and Geological Engineering.

All parties involved explicitly agree that the School will not duplicate existing degree programs, courses, centers, or initiatives. Any new endeavor undertaken by the School will support academic and research units by elevating their profile in terms of higher student enrollment, fostering new collaborations, and increasing the likelihood of attracting additional funding, including seed, training, and large-scale grants.

This is an opportunity to formalize the relationships between an outstanding group of faculty on campus, stakeholders in the global community and a multinational industry working at the forefront of a critical and exciting field. The School is positioned to help support the department of Mining Engineering at UArizona to enhance and broaden our offerings and provide opportunities for research for our faculty and students, and we welcome the new projects on the horizon. As such, this effort has my unreserved support.


Associate Professor and Interim Department Head
David and Edith Lowell Chair in Mining and Geological Engineering


VICE PRESIDENT FOR THE DIVISION OF AGRICULTURE, LIFE AND VETERINARY SCIENCES, AND COOPERATIVE EXTENSION

CHARLES-SANDER DEAN OF THE COLLEGE OF AGRICULTURE AND LIFE SCIENCES

Forbes Building, Room 306
1140 E. South Campus Dr.
PO Box 210036
Tucson, AZ 85721-0036
sburgess@cals.arizona.edu
Tel: 520-621-7621

March 11, 2021
Dear David and Elliot,
I support you establishing a School of Mining Engineering and Mineral Resources and its mission, primarily because, as the deans of the two home colleges, I believe that you should be able to do what is best for your colleges and the UA as a whole, and that you are best placed to know this - pending provost, president and ABOR approval, of course.

The School's discipline areas are outside my academic discipline expertise, so I have no standing to comment on these, but its mission to "transform the way students, professionals and communities work across boundaries to meet the complex challenges of economically, socially, and environmentally sustainable mineral resources" makes sense to me as ALVSCE VP and the CALS Dean. Equally so does your assertion that this new School is "a unique and exciting opportunity for the UA to lead in this area of growing global significance".

As CALS dean, the School does seem to me to complement the CALS' disciplines because of its centrality to the future of Earth's critical zone, global geopolitics and natural resource and sustainable economies. I think the probability of having the nation's "top comprehensive program" around mining engineering and mineral resources, and related disciplines" is not only consistent with the UA Strategic plan but will directly achieve aspects of it. The proposed plan certainly complements UA's, and CALS', global strength in another often-mined natural chemical, water.

The School also seems to me to complement the CALS' faculty who educate and research, and the CES' faculty who extend, in the aspects of mining before and after the extractive phase. The CES may in particular be a good potential partner with the School, analogous to the partnership it has with the Rogers College of Law in the Natural Resource Users Law and Policy Center (and its legal clinic).

As I understand the School to not be a shared academic unit, but rather a shared entity more akin to an Institute or a Center, then my opinion is that it's founding document should include a sunset clause. Of course, given that I understand it will have an endowment, this may not be relevant; in which case I think a statement why it doesn't need a sunset clause would be good.

Best wishes on the School's success.


## To Whom It May Concern:

On behalf of the College of Engineering, I want to express my strongest support for the proposed School of Mining Engineering and Mineral Resources which will be jointly administered by the College of Science and the College of Engineering. I note that the College of Engineering has its roots in the former College of Mining, one of UA's founding colleges. This speaks to the history that mining and geological engineering has played in this college for over 100 years. The proposed School is key to looking forward to the future of mining and mineral resources in the context of our education and research missions. We seek to transform the way students, professionals and communities work across boundaries to meet the complex challenges of economically, socially, and environmentally sustainable mineral resources, in keeping with our proposed mission statement.

Our goal with the proposed School is to position the University of Arizona to be the global leader around mining engineering and mineral resources, linking core disciplines and establishing strong collaborations with related disciplines across the UA campus. The support of our external stakeholders is strong, noting that I have met extensively with industry leaders, many of whom are willing to support the new school financially and are looking to UA for leadership. Along with College of Engineering leadership, I look forward to participating in this important initiative and are supportive of helping UA become a global leader in this area.

## Sincerely,

D. Wuoth

David W. Hahn
Craig M. Berge Dean, College of Engineering
Professor and Eminent Scholar, Aerospace and Mechanical Engineering

March 11, 2021

To Whom It May Concern:
On behalf of the University of Arizona Mel and Enid Zuckerman College of Public Health, I am pleased to offer this letter in support of the newly proposed School of Mining Engineering and Mineral Resources, and its mission to "transform the way students, professionals and communities work across boundaries to meet the complex challenges of economically, socially, and environmentally sustainable mineral resources." I agree this is a unique and exciting opportunity for the University of Arizona to lead in an area of growing global significance, notably a chance to have the nation's top comprehensive program around mining engineering and mineral resources, including all related disciplines.

The Mel and Enid Zuckerman College of Public Health has historically contributed to the goal of advancing the health and safety of miners and the introduction of risk management and critical controls in mining. I see current and future opportunities to contribute to related teaching and research in such areas as environment and occupational health and how this contribution can benefit this College, the new School, the UA community overall, and society.

We look forward to participating in this important initiative and are supportive of helping UA become a global leader in this area.

Sincerely,


Iman Hakim, MD, PhD, MPH
Dean and Professor
Mel and Enid Zuckerman Endowed Chair in Public Health

March 12, 2021

To Whom It May Concern:
On behalf of the College of Social and Behavioral Sciences, I am pleased to offer this letter in support of the newly proposed School of Mining Engineering and Mineral Resources, and in particular to its commitment to socially responsible mining and the proposed School's singular mission to "transform the way students, professionals and communities work across boundaries to meet the complex challenges of economically, socially, and environmentally sustainable mineral resources." This is an exciting opportunity for the University of Arizona to lead in an area of growing global significance and, notably, a chance to build the nation's top comprehensive program around sustainable mining engineering and mineral resources, including all related disciplines.

SBS has significant faculty resources to contribute to this goal. Among our faculty are experts on: engaging multi-sector stakeholders in conflict resolution and problem solving through the process of collaborative governance (School of Government and Public Policy); helping communities assess disaster preparedness, evaluate system vulnerability, and speed post-event resilience (School of Anthropology, School of Sociology); working with Indigenous peoples to assess land-based cultural resources (e.g., sites of archaeological and spiritual significance) (Department of American Indian Studies; School of Anthropology); conducting social cost-benefit analysis and social program evaluation for governmental and non-governmental agencies (School of Government and Public Policy, Southwest Institute for Research on Women); and integrating, mapping, and analyzing multi-sourced geocoded social and environmental data (School of Geography, Development and Environment). I see opportunities to contribute to teaching and research in these and emerging areas (e.g., data science in the School of Information).

We look forward to participating in this important initiative and are supportive of helping UA become a global leader in this area.

## Sincerely,



John Paul Jones III
Don Bennett Moon Dean

March 18, 2021

David W. Hahn, Dean, Craig M. Berge College of Engineering dwhan@arizona.edu

Elliott Cheu, Interim Dean, College of Science
echeu@arizona.edu

Dear David and Elliott,

On behalf of the James E. Rogers College of Law, I am pleased to offer this letter in support of the newly proposed School of Mining Engineering and Mineral Resources. The College of Law has in recent years developed the world's leading online masters program for lawyers and non-lawyers in global mining law and policy. Global Mining Law | University of Arizona Law. The Global Mining Law Center now includes more than 15 courses. I attach a two page list of the current courses. We have also put on a highly successful annual mining law and policy summit for the last several years.

Our global mining law program was created with substantial private support from both alumni, such as Chuck Jeannes and Desmond Kearns, and others excited by our vision, such as Stanley Dempsey and private companies such as Royal Gold and the Rocky Mountain Mineral Law Foundation. Our current goal is to expand these offerings to upper division undergraduates at both the BA in Law program and through cross-listing with other colleges at the University.

Our program has relied on the strength of our faculty and programs in environment law, water law, the top program in the world in indigenous peoples law and policy, and international trade and business law. We have also relied on deep connections across the University of Arizona, drawing us naturally to the idea of a new focal point in the proposed

School of Mining Engineering and Mineral Resources. We see the proposed School as a way to build on university-wide strengths, a distinctive history, the relevance of place, and to address an area that is (again) central to global commerce, industry, and society in the Fourth Industrial Revolution.

Let me offer a little relevant history. The Department of Mining and Geological Engineering was established at the College of Mines by Dr. Willard Lacy in the mid-1960s. One of Dr. Lacy's stated goals was to educate lawyers in the intricacies of geology and mining and established some joint programs between the Colleges of Mines and Law. After Dr. Lacy's retirement, his successor, Dr. Tom O'Neal, in 1976, asked Dr. Lacy's son John, then a mining lawyer, to put together a course in mining law.

John Lacy taught a mining law course in the department and the law school ever since. In 2015, I asked John to put together a series of courses related to mining industry to form the basis of graduate degrees in law, a Master of Legal Studies for mining professionals as well as to provide additional opportunities for our law students. As part of this program, John reached out to Mary Poulton to take advantage of and expand some of the short courses previously offered by the Lowell Institute for Mineral Resources (LIMR.) To this end, we have been able to use the talents of Steve Ralbovsky, Dave Hammond, Doug Silver, Tim Snider, Luke Danielson and Chris Hopkins to prepare and teach courses within the mining law offerings. The LIMR has also been the co-sponsor of all of the Mining Law Summits and Mary has been given a courtesy appointment at the College of Law.

We embrace the stated mission of the new proposed School to "transform the way students, professionals and communities work across boundaries to meet the complex challenges of economically, socially, and environmentally sustainable mineral resources."

We look forward to participating in this important initiative and are supportive of helping UA become a global leader in this area.

Sincerely,
Mare


Marc L. Miller
Dean and Ralph W. Bilby Professor of Law

Dr. Barbara Carrapa
Professor and Department Head Department of Geosciences
Gould-Simpson Building
Tucson, AZ 87521-0077

# Arizona. 

Tucson Arizona
email: bcarrapa@.arizona.edu
Tel. (520) 6216000
Fax (520) 621-2672

Tucson, March 18, 2021

Dear Dr. Che and Dr. Hahn,

Following my conversation with Dr. Mark Barton, the department of Geosciences is supportive of the initiatives described in the proposal for the development of a new School of Mining and Mineral Resources, with the understanding that such initiatives will take advantage of existing synergies, strengthen collaborations among units and enhance research and teaching capabilities within units and across colleges at the University of Arizona. The new School has the unique potential to establish strong and global leadership in the field of mineral resources because of the excellence of units across campus with expertise in this transdisciplinary field and because of its location.

Sincerely,
Boubare cone
Barbara Carrapa
(Professor and Head of Geosciences)

March 17, 2021
To Whom It May Concern:

On behalf of the Eller College of Management, I am pleased to offer this letter in support of the newly proposed School of Mining Engineering and Mineral Resources, and its mission to "transform the way students, professionals and communities work across boundaries to meet the complex challenges of economically, socially, and environmentally sustainable mineral resources." I agree this is a unique and exciting opportunity for the University of Arizona to lead in an area of growing global significance, notably a chance to have the nation's top comprehensive program around mining engineering and mineral resources, including all related disciplines.

The Eller College has historically contributed to the goal of advancing responsible and economically viable mining and use of mineral resources by partnering with the mining industry to provide graduate business education opportunities to employees of local mining organizations, and having our students and faculty work on company-sponsored business related projects to solve real problems. I see current and future opportunities to contribute to related teaching and research in such areas as agile business and economic models for the mining industry, logistics and optimization, smart automation, data analytics and artificial intelligence and how these contributions can benefit this college, the new School, the UA community overall, and society.

We look forward to participating in this important initiative and are supportive of helping UA become a global leader in this area.

Sincerely,

## Paula B. Pies

Paula B. Goes
Dean and Halle Chair in Leadership
Eller College of Management
University of Arizona

## To Whom It May Concern:

On behalf of the School of Anthropology (BoA), I am pleased to offer this letter in support for the proposed School of Mining Engineering and Mineral Resources (SMEMR). As long-time collaborators with colleagues in Mining Engineering and Geosciences, as well as the Lowell Institute for Mineral Resources, SoA faculty are committed to continuing to contribute to efforts through the SMEMR to fulfill its mission to "transform theway students, professionals and communities work across boundaries to meet the complex challenges of economically, socially, and environmentally sustainable mineral resources." We are pleased to support University of Arizona's commitment to leadership in this critical area and to building a successful comprehensive and truly multidisciplinary program around sustainable mining engineering and mineral resources.

The GoA has expertise in many areas relevant to the new SMEMR. We commit to ongoing collaboration in areas such as cultural resources, impact assessment and mitigation planning, collaborative community research, international development, mineralogy and metallurgy, and materials and conservation science. We also look forward to opening up new avenues of collaboration.

Sincerely yours,


Diane E. Austin
Professor and Director
School of Anthropology

## 飛 The University of Arizona。

## NEW ACADEMIC PROGRAM-STANDALONE UNDERGRADUATE MINOR ADDITIONAL INFORMATION FORM

I. MINOR DESCRIPTION- provide a marketing/promotional description for the proposed minor. Include the purpose, nature, and highlights of the curriculum, faculty expertise, etc. The description should match departmental and college websites, handouts, promotional materials, etc.

The AETI Life Sciences Education minor is designed to meet the needs of students who are interested in pursuing a leadership role in an educational setting outside of the traditional classroom environment. Students in the minor will be able to facilitate the exchange of key ideas and practices learned and developed via their major course of study. The exchange of content and ideas, with interested parties, will be facilitated in a non-formal education setting. University of Arizona graduates are highly educated in content topics that will undoubtedly help to improve their local communities. The content and focus of the minor would benefit graduates with the ability to share that information with the public through non-formal education techniques and training. The coursework will prepare graduates to lead and impact diverse communities by understanding that education happens in many formats and environments through non-formal facilitation techniques centered in communication, collaboration and creative thinking.

Completion of this minor will allow students to communicate information in a creative and effective manner. Students completing the minor will understand the fundamental concepts of andragogy and pedagogy to better deliver content focused on improving the lives of consumers in a wide variety of topics through traditional and digital formats within a nonformal setting.

The faculty are experts in leading and facilitating learning opportunities outside of the traditional classroom setting. Through the incorporation of modeling and multiple interactive learning methods the students who complete the minor will be able to utilize the methodology and planning concepts shared throughout the coursework to enhance their own ability to convey information in a fast-paced and engaging manner.
II. MINOR JUSTIFICATION - The justification for the minor comes from the numerous conversations that the faculty has had with past and current students from within the department and the college. The conversations made it very apparent that many of our past and current students would love to have a means to utilize the content knowledge gleaned from their major courses to help improve the communities where they live and work. The students share a true thirst for access to coursework that would prepare them to be able to navigate non-formal education settings and allow them to be true change agents educating the population about real-world, timely topics related to agriculture and the life sciences. Numerous stakeholders have also informed the department that many of our recent graduates are now offering short courses and professional development workshops related directly to their major courses. The training within this non-formal education minor would provide graduates with the tools needed to be highly effective and impactful presenters and educators. The Dean of the College of Agriculture has also expressed an interest in this minor as it is seen as an outlet for students within the Veterinary Science program who wish to supplement their training with the ability to provide education on a wide variety of animal husbandry and care techniques. The combination of very strong and diverse majors within the college when coupled with this new minor should provide students with a plethora of professional choices and allow them to truly serve as change agents in the greater community.
III. MINOR REQUIREMENTS- complete the table below by listing the minor requirements, including minimum number of credit hours, required core, electives, and any special requirements. Note: information in this section must be consistent throughout the proposal documents (comparison charts, curricular/assessment map, etc.). Delete the EXAMPLE column before submitting/uploading.

| Minimum total units required | 18 |
| :--- | :---: |
| Minimum upper-division units required | 9 |
| Total transfer units that may apply to minor | 3 |
| List any special requirements to declare/admission to this minor <br> (completion of specific coursework, minimum GPA, interview, <br> application, etc.) | -Meet with academic advisor within the department |


| Minor requirements. List all required minor requirements including <br> core and electives. Courses listed must include course prefix, number, <br> units, and title. Mark new coursework (New). Include any <br> limits/restrictions needed (house number limit, etc.). Provide <br> email(s)/letter(s) of support from home department head(s) for <br> courses not owned by your department. | Core: <br> AED 462, Curriculum Development (3 units) |
| :--- | :--- |
|  | AED 438, The Teaching of Secondary School Agricultural Science <br> (3 units) <br> AED 450, Total Program Development (3 units) |
|  | Electives: Complete 6 units from the following: <br> AED 301, Youth Leadership Development (3 units) |
|  | AED 437, Methods of Facilitating Learning (3 units) |
| Internship, practicum, applied course requirements (Yes/No). If yes, | Yes. Complete 3 units of internship or practicum with a local <br> provide description. |
| firm: |  |
| AED 493 |  |

IV. CURRENT COURSES-using the table below, list all existing courses included in the proposed minor. You can find information to complete the table using the UA course catalog or UAnalytics (Catalog and Schedule Dashboard> "Printable Course Descriptions by Department" On Demand Report; right side of screen). If the courses listed belong to a department that is not a signed party to this implementation request, upload the department head's permission to include the courses in the proposed minor and information regarding accessibility to and frequency of offerings for the course(s). Upload letters of support/emails from department heads to the "Letter(s) of Support" field on the UAccess workflow form. Add rows to the table, as needed.

| Course prefix and number (include cross-listings) | Units | Title | Course Description | Pre-requisites | Modes of delivery (online, | Typically Offered | Dept signed party to |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |


|  |  |  |  |  | in-person, hybrid) | $\begin{aligned} & \text { (F, W, Sp, } \\ & \text { Su) } \end{aligned}$ | proposal? <br> (Yes/No) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| AED 462 | 3 | Curriculum Development | Prepares student teachers for their year in preservice. Provides introductory material on curriculum development, record books and experiential education, and the student organization as it relates to agricultural education. | None | In-person | Sp | No |
| AED 438 | 3 | The Teaching of Secondary School Agricultural Science | Specific methods, objectives, organization of subject matter, and evaluation in the various subjects. | AED 462 | In-person | F | No |
| AED 450 | 3 | Total Program Development | This course is designed to prepare preservice agriculture teachers to work with the intracurricular and peripheral programs that are an integral part of the three circle model of agricultural education. Course content will include: experiential learning, student organizations, and school and community relationships in a formal education setting. | None | In-person | Sp | No |
| AED 493 | 3 | Internship | Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment. | None | In-Person, Online, Hybrid | $\begin{aligned} & \text { F, W, Sp, } \\ & \text { Su } \end{aligned}$ | No |
| AED 301 | 3 | Youth Leadership Development | Characteristics of effective advisors, leadership styles, strategies for the management and organization of youth groups in agriculture, practice in leadership development techniques. | None | In-Person | F | No |
| AED 437 | 3 | Methods of Facilitating Learning | Students will plan, facilitate, and assess learning experiences for a myriad of nonformal teaching/learning situations. Students will be able to identify and apply resources and methods for facilitating learning with multiple audiences. Students will also learn how to develop objectives and assessments, | None | In-Person | Sp | No |


V. NEW COURSES NEEDED - using the table below, list any new courses that must be created for the proposed program. If the specific course number is undetermined, please provide level (ie CHEM $4^{* *}$ ). Add rows as needed. Is a new prefix needed? If so, provide the subject description so Curricular Affairs can generate proposed prefix options.

| Course prefix and number (include crosslistings) | Units | Title | Course Description | Prerequisites | Modes of delivery (online, in-person, hybrid) | Status* | Anticipated first term offered | Typically <br> Offered <br> (F, W, <br> $\mathrm{Sp}, \mathrm{Su}$ ) | Dept signed party to proposal? (Yes/No) | Faculty members available to teach the courses |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| N/A | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
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*In development (D); submitted for approval (S); approved (A)
Subject description for new prefix (if requested). Include your requested/preferred prefix, if any:
VI. FACULTY INFORMATION- complete the table below. If UA Vitae link is not provided/available, attach a short CV (2-3 pages) to the end of the proposal or upload to the workflow form. UA Vitae profiles can be found in the UA directory/phonebook.

| Faculty Member | Involvement | UA Vitae link or "CV attached" |
| :--- | :--- | :--- |
| Dr. Amber Rice | Teach AED 462; AED 450; AED 437 | CV attached |


| Mr. Quintin Molina | Teach AED 301; AED 438 <br> Supervise AED 493 Internship | CV attached |
| :--- | :--- | :--- |
| Mr. Breanna Watkins | Advise Students within the Minor | CV attached |

VII. STUDENT LEARNING OUTCOMES AND CURRICULUM MAP—describe what students should know, understand, and/or be able to do at the conclusion of this minor. Work with Office of Instruction and Assessment to create a curricular map using Taskstream. Include your curricular map in this section (refer to Appendix A for sample Curriculum Map generated using Taskstream).

## Curriculum Map:

| Minor Life Science Education Map (Streamlined) <br> Courses and Activities Mapped to Minor in Life Science Education Outcome Set |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Outcome |  |  |  |  |  |  |
|  | Outcome 1: Identify and incorporate a wide variety of instructional resources and materials to develop and design curriculum that meets the needs of the learner. | Outcome 2 Identify and implement key instructional methodologies to engage learners using various activities and engagement strategies for all learners | Outcome 3 <br> Evaluate and assess the progress of learners in the non-formal learning environment based on sound measurement metrics. | Outcome 4 Enhance community development through community relationships and community based organizations. | Outcome 5 Utilize key leadership development concepts to create community based non-formal education environments | Outcome 6 Engage in a content specific experiential learning internship experience. |
| Courses and Learning Activities |  |  |  |  |  |  |
| AED 462 <br> Curriculum Development | I | I | I |  |  |  |
| AED 438 | P, A | P | P |  |  |  |


| Teaching of Secondary School Agricultural Science |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| AED 450 <br> Total Program Development |  |  |  | I, P, A | I, P, A | I, P |
| AED 493 Internship |  |  |  |  |  | P, A |
| AED 301 <br> Youth Leadership Development |  |  |  | I, P, A | I, P, A |  |
| AED 437 <br> Methods of Facilitating Learning | I, P, A | I, P, A | I, P, A |  |  |  |
| I = Introduced; P = Practiced; A = Assessed |  |  |  |  |  |  |

VIII. ASSESSMENT PLAN FOR STUDENT LEARNING- using the table below, provide a schedule for program assessment of intended student learning outcomes 1) while students are in the program and 2) after completion of the minor. Add rows as needed. Delete EXAMPLE row.

| Learning Outcomes | Sources(s) of Evidence | Assessment Measures | Data Collection Points |
| :---: | :---: | :---: | :---: |
| Outcome 1: <br> Identify and incorporate a wide variety of instructional resources and materials to develop and design curriculum that meets the needs of the learner. | - Course-embedded assessments <br> - Essays <br> - Student Presentations | - Exams, papers, presentations, discussions <br> - Curriculum Presentation <br> - Workshop Design \& Presentation | - End of AED 437; AED 438 |
| Outcome 2: <br> Identify and implement key instructional methodologies to engage learners using various activities and engagement strategies for all learners | - Course-embedded assessments <br> - Essays <br> - Student Presentations | - Early Field Experiences <br> - Workshop Design \& Presentation <br> - Curriculum Presentations | - End of AED 462; 438; 437 |
| Outcome 3: <br> Evaluate and assess the progress of learners in the non-formal learning environment based on sound measurement metrics. | - Course-embedded assessments <br> - Essays <br> - Student Presentations | - Exams, papers, presentations, discussions <br> - Assessment Project Formative/Summative <br> - Curriculum Presentations | - End of; 462; 438; 437 |


|  |  | - Workshop Evaluation |  |
| :---: | :---: | :---: | :---: |
| Outcome 4: <br> Enhance community development through community relationships and community based organizations. | - Course-embedded assessments <br> - Essays <br> - Student Presentations | - Personal Evaluation of Leadership Skills <br> - Group Project on Key Leadership Traits <br> - Community Needs Assessment <br> Experiential Learning Content Development | - End of; AED 301; AED 450 |
| Outcome 5: <br> Utilize key leadership development concepts to create community based nonformal education environments | - Course embedded assessments <br> - Exams and Presentations <br> - Early Field Experiences/Observations | - Personal Evaluation of Leadership Skills <br> - Group Project on Key Leadership Traits <br> - Community Needs Assessment <br> - Experiential Learning Content Development | - End of; AED 301; AED 450; AED 493 |
| Outcome 6: <br> Engage in a content specific experiential learning internship experience. | - Internship Agreement Packet <br> - Mid \& Final Intern Evaluation from Packet <br> - Final Internship Evaluation | - Internship Experience Blog Posts <br> - Summative Internship Experience Portfolio <br> - Final Presentation of Internship Experience | - End of Each Course <br> - End of ALC/AED/AGTM 493 Course |

IX. ANTICIPATED STUDENT ENROLLMENT-complete the table below. What concrete evidence/data was used to arrive at the numbers?

| 5-YEAR PROJECTED ANNUAL ENROLLMENT |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
|  | $1^{\text {st }}$ Year | $2^{\text {nd }}$ Year | $3^{\text {rd }}$ Year | $4^{\text {th }}$ Year | $5^{\text {th }}$ Year |
| Number of <br> Students | 6 | 8 | 10 | 15 | 20 |

Data/evidence used to determine projected enrollment numbers:
The projections are calculated utilizing current student interest and conversations/meetings between current faculty and students with the College of Agriculture and Life Sciences who have expressed interest in this proposed minor.
X. $\quad$ ANTICIPATED MINORS AWARDED- complete the table below, beginning with the first year in which minors will be awarded. How did you arrive at these numbers? Take into consideration departmental retention rates.

|  | $1^{\text {st }}$ Year | $2^{\text {nd }}$ Year | $3^{\text {rd }}$ Year | $4^{\text {th }}$ Year | $5^{\text {th }}$ Year |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Number of <br> Minors | 0 | 5 | 8 | 12 | 16 |

Data/evidence used to determine number of anticipated minors awarded annually:
The projections are calculated utilizing current interest from students within the college and the increase in number is related to the ability to market the minor once it has been approved. The department's retention rate has remained high over the last four years the time to completion for current major and minor degrees has been on par with those of similar degree programs.
XI. PROGRAM DEVELOPMENT TIMELINE- describe plans and timelines for 1 ) marketing the minor and 2 ) student recruitment activities.
The Department of Agricultural Education, Technology \& Innovation plans to begin marketing the minor in the fall 2020 semester. The marketing plan will consist of email blasts to multiple advisor groups throughout the UArizona campus as well as presentations on the minor within current AED, AGTM and ALC courses. The department will also share the information during tabling evens such as the Meet Your Major event in October and the numerous College of Agriculture and Life Sciences open houses, as well as share the information via the college recruiters who visit multiple high schools during both the fall and spring semesters. The plan is to begin enrolling students into the minor during the spring 2021 academic advising sessions beginning in Fall 2021.
XII. DIVERSITY AND INCLUSION-describe how you will recruit diverse students and faculty to this minor. In addition, describe retention efforts in place or being developed in order to retain students.
The department consists of an extremely diverse faculty which encompasses a true desire to provide learners with a holistic approach to teaching and learning. The recruitment plan will engage students from many diverse majors and will bring students in from numerous colleges across our diverse campus. The fact that the minor is designed to enhance the learning that occurs within the student's chosen major grants tremendous opportunity for diversity of not only the students involved but the streams of thoughts and ideas each unique student will bring to the minor.

Retention of students will incorporate many facets of inclusion to help maintain a consistent connection with the students
enrolled within the minor. The department will utilize multiple digital platforms to stay connected to students and is extremely integrated within multiple student organizations within the college and university system that provides students with diverse options for finding and maintaining a connection to the minor and the department. The students within the minor will be provided with continuous access to advising as well as the faculty who are engaged in the coursework within the minor. The goal of the department is to provide and holistic and inclusive environment that all but guarantees student success.

| [AT THE UNIVERSITY OF ARIZONA* |  |  |  |
| :---: | :---: | :---: | :---: |
| BUDGET PROJECTION FORM |  |  |  |
| Name of Proposed Program or Unit: |  |  |  |
|  |  | Projected |  |
| Budget Contact Person: | $\begin{gathered} \text { 1st Year } \\ \text { 2021-2022 } \end{gathered}$ | $\begin{gathered} \text { 2nd Year } \\ 2022-2023 \end{gathered}$ | $\begin{gathered} \text { 3rd Year } \\ 2023-2024 \end{gathered}$ |
| METRICS |  |  |  |
| Net increase in annual college enrollment UG | 10 | 15 | 15 |
| Net increase in college SCH UG | 180 | 270 | 270 |
| Net increase in annual college enrollment Grad | 0 | 0 | 0 |
| Net increase in college SCH Grad | 0 | 0 | 0 |
| Number of enrollments being charged a Program Fee | 0 | 0 | 0 |
| New Sponsored Activity (MTDC) | 0 | 0 | 0 |
| Number of Faculty FTE | 0 | 0 | 0 |
| FUNDING SOURCES |  |  |  |
| Continuing Sources |  |  |  |
| UG RCM Revenue (net of cost allocation) | 0 | 0 | 0 |
| Grad RCM Revenue (net of cost allocation) | 0 | 0 | 0 |
| Program Fee RCM Revenue (net of cost allocation) | 0 | 0 | 0 |
| F and A Revenues (net of cost allocations) | 0 | 0 | 0 |
| UA Online Revenues | 0 | 0 | 0 |
| Distance Learning Revenues | 0 | 0 | 0 |
| Reallocation from existing College funds (attach description) | 0 | 0 | 0 |
| Other Items (attach description) | 0 | 0 | 0 |
| Total Continuing | \$ | \$ | \$ |
| One-time Sources |  |  |  |
| College fund balances | 0 | 0 | 0 |
| Institutional Strategic Investment | 0 | 0 | 0 |
| Gift Funding | 0 | 0 | 0 |
| Other Items (attach description) | 0 | 0 | 0 |
| Total One-time | \$ | \$ | \$ |
| TOTAL SOURCES | \$ | \$ | \$ |
|  |  |  |  |
| EXPENDITURE ITEMS |  |  |  |
| Continuing Expenditures |  |  |  |
| Faculty | 0 | 0 | 0 |
| Other Personnel | 0 | 0 | 0 |
| Employee Related Expense | 0 | 0 | 0 |
| Graduate Assistantships | 0 | 0 | 0 |
| Other Graduate Aid | 0 | 0 | 0 |
| Operations (materials, supplies, phones, etc.) | 0 | 0 |  |
| Additional Space Cost | 0 | 0 | 0 |
| Other Items (attach description) | 0 | 0 | 0 |
| Total Continuing | \$ | \$ | \$ |
| One-time Expenditures |  |  |  |
| Construction or Renovation | 0 | 0 | 0 |
| Start-up Equipment | 0 | 0 | 0 |
| Replace Equipment | 0 | 0 | 0 |
| Library Resources | 0 | 0 | 0 |
| Other Items (attach description) | 0 | 0 | 0 |
| Total One-time | \$ | \$ | \$ |
| TOTAL EXPENDITURES | \$ - | \$ | \$ |
| Net Projected Fiscal Effect | \$ | \$ | \$ |

# 发 The UNiversity of ArizonA。 New Academic Program Workflow Form 

## General

Proposed Name: Data Science
Transaction Nbr: 00000000000089
Plan Type: Major
Academic Career: Graduate
Degree Offered: Master of Science
Do you want to offer a minor? N
Anticipated 1st Admission Term: Fall 2021

## Details

Department(s):
SBSC

| DEPTMNT ID | DEPARTMENT NAME | HOST |
| :--- | :--- | :--- |
| 0481 | School of Information | Y |

Campus(es):
ONLN

| LOCATION | DESCRIPTION |
| :--- | :--- |
| ONLN | Online |

Admission application terms for this plan: Spring: Y Summer: Y Fall: Y
Plan admission types:
Freshman: N Transfer: N Readmit: N Graduate: Y
Non Degree Certificate (UCRT only): Y
Other (For Community Campus specifics): N

Plan Taxonomy: 30.7001, Data Science, General.

Program Length Type: Program Length Value: 0.00
Report as NSC Program:
SULA Special Program:

## Print Option:

Diploma: Y Master of Science in Data Science
Transcript: Y Master of Science in Data Science

## Conditions for Admission/Declaration for this Major:

The application will have 4 explicit questions asking the applicant to list coursework or professional experience that meets these criteria.

1. Strong quantitative and analytical reasoning abilities, as demonstrated by academic coursework and/or professional experience.
2. Experience with math and programming, including data structures, analysis of algorithms, and linear algebra, as demonstrated by academic coursework and/or professional experience.
3. What programming language do you use most frequently?
4. In the past 3 months, how much time (on average) have you spent each week coding?

## Requirements for Accreditation:

N/A

## Program Comparisons

## University Appropriateness

Data Science is part of the landscape of the fourth industrial revolution. UA's Strategic Plan focuses on transdisciplinary convergence, to realize the transformative power of emerging data science methodologies and tools. The School of Information's proposed MS degree presents a compelling opportunity to build on UA's unique strengths in interdisciplinary efforts given the existence of data science across units and programs. This degree advances the College of Social and Behavioral Sciences strategic plan to offer a broad-based education and the iSchool's focus on issues that lay at the intersections of data, technology, and people.

## Arizona University System

| NBR | PROGRAM | DEGREE | \#STDNTS | LOCATION | ACCRDT |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 1 | Information <br> and Data <br> Science | MS | 792 | UC Berkeley | N |
| 2 | Data <br> Science | MS | 393 | University of <br> Wisconsin | N |

## Peer Comparison

See attached chart

## Faculty \& Resources

Faculty
Current Faculty:

| INSTR ID | NAME | DEPT | RANK | DEGREE | FCLTY/\% |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 00202612 | Bruce Fulton | 0481 | Assoc. Prof | Doctor of <br> Philosophy | 1.00 |
| 08308838 | John Hartman | 0412 | Assoc. Prof | Doctor of <br> Philosophy | 1.00 |
| 11709208 | Steven <br> Bethard | 0481 | Assoc. Prof | Doctor of <br> Philosophy | 1.00 |
| 12200140 | Young-Jun <br> Son | 2302 | Professor | Doctor of <br> Philosophy | 1.00 |
| 16508028 | Hong Cui | 0481 | Professor | Doctor of <br> Philosophy | 1.00 |
| 17206152 | Clayton <br> Morrison | 0481 | Assoc. Prof | Doctor of <br> Philosophy | .60 |
| 17905279 | Patrick <br> Heidorn | 0481 | Professor | Doctor of <br> Philosophy | 1.00 |
| 22052443 | Peter Jansen | 0481 | Assit. Prof | Doctor of <br> Philosophy | 1.00 |
| 22067613 | Gregory <br> Ditzler | 2303 | Assit. Prof | Doctor of <br> Philosophy | 1.00 |
| 22083799 | Jason <br> Pacheco | 0412 | Assit. Prof | Doctor of <br> Philosophy | 1.00 |
| 22083805 | Chicheng <br> Zhang | 0412 | Assit. Prof | Doctor of <br> Philosophy | 1.00 |
| 22084317 | Ryan Rucker <br> 22088136Meaghan <br> Wetherell | 0481 | Adj. Instor. | Doctor of <br> Education | 1.00 |
| 23152438 | Gustave <br> Hahn-Powell | 0431 | Assit. Prof | Doctor of <br> Philosophy | 1.00 |
| 23263591 | Doctor of <br> Philosophy <br> Picoral <br> Sarandy <br> Machado <br> Scheid | 0481 | Assit. Prof | Doctor of <br> Philosophy | 1.00 |

Additional Faculty:
None
Current Student \& Faculty FTE

| DEPARTMENT | UGRD HEAD COUNT | GRAD HEAD COUNT | FACULTY FTE |
| :--- | :--- | :--- | :--- |
| 0481 | 634 | 250 | 44.78 |

Projected Student \& Faculty FTE

|  | UGRD HEAD COUNT |  |  | GRAD HEAD COUNT |  |  | FACULTY FTE |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| DEPT | YR 1 | YR 2 | YR 3 | YR 1 | YR 2 | YR 3 | YR 1 | YR 2 | YR 3 |
| 0481 | 648 | 669 | 690 | 293 | 349 | 449 | 44.78 | 44.78 | 44.78 |

## Library

Acquisitions Needed:
None

## Physical Facilities \& Equipment

Existing Physical Facilities:
Program will be online and will not need physical facilities
Additional Facilities Required \& Anticipated:
Program will be online and will not need physical facilities

## Other Support

Other Support Currently Available:
None
Other Support Needed over the Next Three Years:
None

## Comments During Approval Process

2/1/2021 1:58 PM
CFBROOKS

## Comments

Approved.

## 2/1/2021 2:02 PM

RICAR22

| Comments |
| :--- |
| Approved. |

## 2/1/2021 2:36 PM <br> CRAIGWILSON

## Comments

Approved.

3/5/2021 11:02 AM

## ESANDMAR

## Comments

Uploaded updated add'I info form.

## NEW ACADEMIC PROGRAM-GRADUATE MAJOR

## ADDITIONAL INFORMATION FORM

I. MAJOR DESCRIPTION -provide a marketing/promotional description for the proposed program. Include the purpose, nature, and highlights of the curriculum, faculty expertise, emphases (sub-plans; if any), etc. The description should match departmental and college websites, Graduate Catalog and Program Descriptions page, handouts, promotional materials, etc.

The theory and tools behind Data Science are used throughout the academy, stretching from the humanities to the biological sciences and from the fine arts to physics and engineering. Data Science is thus both transdisciplinary across the academy and at the same time foundational in many specific fields. The 30 -unit M. S. program in Data Science in the iSchool draws upon the expertise of iSchool faculty directly engaged in issues at the intersection of technology, people, and information, thus drawing upon a central foundation in information science.

However, by making use of the novel structure of stacked certificates, it also engages with programs throughout the university to provide students with opportunities to develop skills and knowledge appropriate to their specific interests and domains of study.

The stacked certificate model constructs an online master's degree, where students enroll in a core information science certificate, and then also pursue elective certificates in a wide range of specializations. They combine these certificates into a single Master's degree, which is completed by a synthesizing capstone project or portfolio that integrates the three certificates.

The stacked certificate model allows students a variety of options for entry into the degree. If they are uncertain that they want to purse a full MS they can take any of the certificates as free-standing options. If they decide they want the MS they can apply at any point (within 4 years of the completion of a certificate) and synthesize their experiences through the capstone. Other students may wish to simply enroll directly into the MS degree from the beginning and take the certificates en route to their MS.

The MS degree is structured as follows:

1) Required Core Certificate (9 units) offered by the iSchool
2) A required synthesizing capstone project (3 units) managed by the iSchool along with campus partners.
3) Option to select certificates from this list (9 units each), future certificates (9-15 units, typically) developed from across domain areas at the University of Arizona, or to choose a set of elective course choices to complete their plan.

Available Elective Certificates for Academic Year 2021/2022
Certificate 1: Foundations of Data Science (School of Information)
Certificate 2: Natural Language Processing (Linguistics)

## Planned certificates for Spring 2022 launch

Certificate 3: Database Management (School of Information)
Certificate 4: Spatial Data Science (School of Geography)

We are in negotiations to develop additional elective certificates in a wide variety of disciplines with other programs and colleges. Additional elective certificate proposals are always welcome as are the option to include existing certificates in the area of Data Science.


#### Abstract

Through transdisciplinary stacked certificate curriculum, the MS in Data Science program produces generations of professionals and researchers who have the knowledge, skill, and ability to engage in data science processes and work. This degree will encompass a blend of disciplines to address the grand challenges of today and the future. The MS in Data Science provides students the training they need in data collection, exploration, manipulation and storage, analysis, and presentation in order to navigate data-rich workplace environments.


CIP CODE - 30.7001 Data Science, General.
II. NEED FOR THE MAJOR/JUSTIFICATION-describe how the major fulfills the needs of the city, state, region, and nation. Provide market analysis data or other tangible evidence of the need for and interest in the proposed major (and emphases, if applicable). This might include results from surveys of current students, alumni, and/or employers or reference to student enrollments in similar programs in the state or region. Include an assessment of the employment opportunities for graduates of the program for the next three years. Curricular Affairs can provide a job posting/demand report by skills obtained/outcomes/CIP code of the proposed major. Please contact the Office of Curricular Affairs to request the report for your proposal.

The proposed MS in Data Science program housed in the iSchool will support the priorities outlined in the UA's Strategic Plan. This degree will prepare graduates to be innovative scientific leaders. Enhancing the supply of welltrained leaders in the data sciences will help catalyze economic development in the state of Arizona. Built upon the foundations of probability theory, optimization, as well as algorithmic thinking and doing, the data sciences include a broad set of approaches to include bioinformatics, natural language processing, machine learning, data mining, data visualization, and more. The stacked certificate model means that the program can provide a structure for transdisciplinary collaborations.

The state of Arizona's economy relies heavily on technological design and information-based industries. According to the Arizona Commerce Authority (Arizona Business Know How), the core of Arizona's competitiveness plan includes Aerospace \& Defense as well as Technology \& Innovation. Arizona seeks to foster deep partnerships with major electronics (Intel, Motorola, IBM, Raytheon, etc.) and biotechnology (Ventana, Medtronic, Flinn Foundation, etc.) industries. To support these industries, the State needs a workforce that is broadly educated in data science. This degree program is unique in its combination of training in the foundations of data science, while also training learners to be inherently interdisciplinary.

According to U.S. News, Data Scientist jobs are 8 out of 100 best jobs in the United States. With a median salary of $\$ 94,280$ and a $3.5 \%$ unemployment rate, this newer career field is increasingly recognized by employers as a valuable asset to their companies (Data Scientist Ranks Among Best Jobs of 2021, n.d.) The Bureau of Labor Statistics projects 31 percent employment growth for data scientists between 2019 and 2029 (Fastest Growing Occupations: Occupational Outlook Handbook, 2020). The online Master's in Data Science at the UC Berkeley School of Information has graduates working in jobs such as data analyst, data architect, data engineer, solutions architect, and systems engineer at top tier companies like Amazon, Apple, Facebook, Microsoft, and Google (Online Master of Data Science Degree, n.d.). The Master's in Data Science program at the Indiana University

School of Information is also exemplary, and covers most primarily the domains of data analytics and visualization, intelligent systems engineering, precision health, and cybersecurity (M.S. in Data Science-Online, n.d.).

For iSchools, data science programs involve faculty and courses across disciplines and organizational units. iSchools are inherently interdisciplinary places given the broad reach of informatics and information science. iSchools "...have been newly created or are evolving from programs formerly focused on specific tracks such as information technology, library science, informatics, and information science. While each individual iSchool has its own strengths and specializations, together they share a fundamental interest in the relationships between information, people, and technology" (https://ischools.org/About). Schools are distinct in their working across disciplines, always focused on making data findable, visible and useful for people across domains. At the University of Arizona, as well as on other campuses, data science resides in a wide variety of units and Colleges. Almost every College on Campus has a program that fits within the broad definition of Data Science. So, units and Colleges across the campus are invited to participate in this degree by adding certificates that can be 'stacked' into this M. S. program.

## References

Data Scientist Ranks Among Best Jobs of 2021. (n.d.). Retrieved January 12, 2021, from

## https://money.usnews.com/careers/best-jobs/data-scientist.

Fastest Growing Occupations: Occupational Outlook Handbook: : U.S. Bureau of Labor Statistics. (September

1, 2020). Retrieved January 12, 2021, from https://www.bls.gov/ooh/fastest-growing.htm.
M.S. in Data Science—Online. (n.d.). Data Science Program. Retrieved January 12, 2021, from
https://datascience.indiana.edu/programs/ms-data-science-online/index.html.

Online Master of Data Science Degree. (n.d.). Retrieved January 12, 2021, from
https://ischoolonline.berkeley.edu/data-science/.

The iSchools Organization. (n.d.). Retrieved April 7, 2021 from https://ischools.org/About.

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III. MAJOR REQUIREMENTS- complete the table below by listing the major requirements, including required number of units, required core, electives, and any special requirements, including emphases (sub-plans), thesis, internships, etc.

| Total units required to complete the <br> degree | 30 |
| :--- | :--- |
| Pre-admissions expectations (i.e. <br> academic training to be completed <br> prior to admission) | Applicants are expected to have completed undergraduate coursework in <br> programming and statistics. Coursework in calculus preferred but not <br> required. The application will have 2 explicit questions asking the applicant to <br> list coursework or professional experience that meets these criteria. <br> 1. What academic coursework and/or professional experience demonstrates <br> your strong quantitative and analytical reasoning abilities? <br> 2. What academic coursework and/or professional experience demonstrates <br> your experience with math and programming, including data structures, <br> analysis of algorithms, and linear algebra? |
| Major requirements. List all major <br> requirements including core and <br> electives. If applicable, list the <br> emphasis requirements for each <br> proposed emphasis*. Courses listed <br> must include course prefix, number, <br> units, and title. Mark new coursework <br> (New). Include any limits/restrictions <br> needed (house number limit, etc.). <br> Provide email(s)/letter(s) of support <br> from home department head(s) for <br> courses not owned by your <br> department. | Core Courses, 9 units <br> (comprise cert. \#1 Foundations of Data Science) <br> INFO 520 (3 units) Ethical Issues in Information <br> INFO 523 (3 units) Data Mining and Discovery <br> INFO 526 (3 units) Data Visualization |
| INFO 698 Capstone Project |  |

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```
LING 578 (3 units) Speech Technology
LING }581\mathrm{ (3 units) Advanced Computational Linguistics
INFO 557 (3 units) Neural Networks
CSC 583 (3 units) Text Retrieval and Web Search
CSC 585 (3 units) Algorithms for Natural Language Processing
Certificate 3: Database Management (School of Information and School of
Geography)
INFO 579: (3 units) Database Design in SQL
INFO 570:(3 units) Database Development and Management
GIST 570: (3 units) Geodatabase
Certificate 4: Geospatial Data Science (School of Geography)
GIST XXX: (3 units) Geospatial Visualization
GIST 603A: (3 units) Geog. Info. Systems Programming/Automation
GIST 604B: (3 units) Open Source GIS
Elective Courses Not Organized as part of Certificates
(if not opting for a set of certificates, courses can also be chosen from this
set).
ECE 523 (3 units) Machine Learning
ECE 524 (3 units) Fundamentals of Cloud Security
ECE 579(3 units) Artificial Intelligence
INFO 514/POL 514 (3 units) Computational Social Science
INFO 521 (3 units) Machine Learning
INFO 531 (3 units) Data Warehousing and Analytics in the Cloud
INFO 536 (3 units) Data Science and Public Interests
INFO 555 (4 units) Applied Natural Language Processing
INFO 556 (3 units) Text Retrieval and Web Search
INFO 578 (3 units) Science Information and its Presentation
SIE 530: (3 units) Engineering Statistics
SIE 533: (3 units) Fundamentals of Data Science for Engineers
SIE 545 (3 units) Fundamentals of Optimization
SIE 640 (3 units) Large-Scale Optimization
SIE }645\mathrm{ (3 units) Nonlinear Optimization
```

Yes, research methods, data analysis, and methodology are taught in three of the four core courses as well as in all of the elective courses.

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|  |  |
| :--- | :--- |
| Internship, practicum, applied course <br> requirements (Yes/No). If yes, <br> provide description. | Yes, Capstone course. INFO698 Capstone Project |
| Master thesis or dissertation required <br> (Yes/No). If yes, provide description. | No |
| Additional requirements (provide <br> description) | None |
| Minor options (as relevant) |  |

IV. CURRENT COURSES- using the table below, list all existing courses included in the proposed major. You can find information to complete the table using the UA course catalog or UAnalytics (Catalog and Schedule Dashboard> "Printable Course Descriptions by Department" On Demand Report; right side of screen). If the courses listed belong to a department that is not a signed party to this implementation request, upload the department head's permission to include the courses in the proposed program and information regarding accessibility to and frequency of offerings for the course(s). Upload letters of support/emails from department heads to the "Letter(s) of Support" field on the UAccess workflow form. Add rows to the table, as needed.

| Course <br> prefix and <br> number | Units | Title | Course Description | Pre- <br> reqs | Modes of <br> delivery <br> Su) |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| CSC 583 | 3 | Text Retrieval <br> and Web <br> Search | Typically <br> Offered <br> Most of the web data today consists <br> of unstructured text. Of course, the <br> fact that this data exists is irrelevant, <br> unless it is made available such that <br> users can quickly find information <br> that is relevant for their needs. This <br> course will cover the fundamental <br> knowledge necessary to build these | MATH | Online, in- <br> person | F |

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|  |  |  | systems, such as web crawling, index construction and compression, Boolean, vector-based, and probabilistic retrieval models, text classification and clustering, link analysis algorithms such as PageRank, and computational advertising. The students will also complete one programming project, in which they will construct one complex application that combines multiple algorithms into a system that solves real-world problems. |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CSC 585 | 3 | Algorithms for Natural Language Processing | This course covers important algorithms useful for natural language processing (NLP), including distributional similarity algorithms such as word embeddings, recurrent and recursive neural networks (NN), probabilistic graphical models useful for sequence prediction, and parsing algorithms such as shift-reduce. This course will focus on the algorithms that underlie NLP, rather than the application of NLP to various problem domains. | None | Online, inperson | F, Sp |
| ECE 523 | 3 | Engineering Applications of Machine Learning and Data Analytics | Machine learning deals with the automated classification, identification, and/or characterizations of an unknown system and its parameters. There are an overwhelming number of application driven fields that can benefit from machine learning techniques. This course will introduce you to machine learning and develop core principles that allow you to determine which algorithm to use, or design a novel approach to solving to engineering | $\begin{aligned} & \text { ECE } \\ & 503 \end{aligned}$ | Online, inperson | Sp |


|  |  | NEW ACADEMIC PROGRAM-GRADUATE MAJOR |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \text { ERSII } \\ & \text { ONA } \end{aligned}$ |  |  |  |  |  |
|  |  |  | task at hand. This course will also use software technology to supplement the theory learned in the class with applications using real-world data. |  |  |  |
| ECE 524 | 3 | Fundamentals of Cloud Security | Cloud Computing is an emerging paradigm that aims at delivering computing, information services, and data storage as a utility service over a network (e.g., Internet). There is a strong interest in cloud computing due to their performance and host, but their rapid deployment will exacerbate the security problem. In cloud computing, organizations relinquish direct control of many security aspects to the service providers such as trust, privacy preservation, identity management, data and software isolation, and service availability. The adoption and proliferation of cloud computing and services will be severely impacted if cloud security is not adequately addressed. The main goal of this course is discuss the limitations of current cybersecurity approaches to clouds and then focus on the fundamental issues to address the cloud security and privacy such as the confidentiality, integrity and availability of data and computations in clouds. In this course we will examine cloud computing models, look into the threat model and security issues related to data and computations outsourcing, and explore practical applications to make cloud resources secure and resilient to cyber attacks. | None | Online, inperson | Sp |



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| GIST 603A | 3 | Geographic Information Systems Programming and Automation | The goal of this course is to gain an introductory understanding of geographic programming and data automation techniques using ModelBuilder and the Python language. | None | Online, inperson | F, Sp, Su |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| GIST 604B | 3 | Open Source GIS | The focus of this class is to examine and apply GIS open source programming. We will examine common languages used like Python, Java, html 5, as well as APIs, JSON, html, and SQL, to automate workflows, extend the tools, and create interactive web and mobile GS platforms. Topics include preparing data as strings, lists, tuples, and dictionaries prior to use, using Python to run SQL queries, working with roasters in Python, automating mapping tasks, and developing custom scripting tools. In addition to weekly assignments and readings, assessment will be oriented around a single, student-directed project that will take the second half of the semester to complete. It will require students to write a simple script to accomplish a specified task in ArcGIS and present the results of their work to peers. | None | Online, inperson | F, SP |
| INFO 514 <br> (POL514) | 3 | Computational Social Science | This course will guide students through advanced applications of computational methods for social science research. Students will be encouraged to consider social problems from across sectors, like health science, education, environmental policy and business. Particular attention will be given to | None | Online, inperson | Sp |

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|  |  |  | the collection and use of data to study social networks, online communities, electronic commerce and digital marketing. Students will consider the many research designs used in contemporary social research and will learn to think critically about claims of causality, mechanisms, and generalization in big data studies. Graduate requirements include additional readings and a more indepth final paper than is required at the undergraduate level. |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| INFO 520 | 3 | Ethical Issues in Information | This course presents an overview and understanding of the intractable and pressing ethical issues as well as related policies in the information fields. Emerging technological developments in relation to public interests and individual well-being are highlighted throughout the course. Special emphasis is placed on case studies and outcomes as well as frameworks for ethical decisionmaking. | $\begin{aligned} & \text { INFO } \\ & 420 \end{aligned}$ | Online, inperson | F, Sp |
| INFO 521 | 3 | Introduction to Machine Learning | Machine learning describes the development of algorithms which can modify their internal parameters (i.e., "learn") to recognize patterns and make decisions based on example data. These examples can be provided by a human, or they can be gathered automatically as part of the learning algorithm itself. This course will introduce the fundamentals of machine learning, will describe how to implement several practical methods for pattern | Must have taken ISTA 311, MATH 129, AND MATH 313, or equival ent, or consen | Online, inperson | F |

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|  |  |  | recognition, feature selection, clustering, and decision making for reward maximization, and will provide a foundation for the development of new machine learning algorithms. | tof instruct or. ISTA 116 or compar able is recom mende d. |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| INFO 523 | 3 | Data Mining and Discovery | This course will introduce students to the concepts and techniques of data mining for knowledge discovery. It includes methods developed in the fields of statistics, large-scale data analytics, machine learning, pattern recognition, database technology and artificial intelligence for automatic or semi-automatic analysis of large quantities of data to extract previously unknown interesting patterns. Topics include understanding varieties of data, data preprocessing, classification, association and correlation rule analysis, cluster analysis, outlier detection, and data mining trends and research frontiers. We will use software packages for data mining, explaining the underlying algorithms and their use and limitations. The course include laboratory exercises, with data mining case studies using data from many different resources such as social networks, linguistics, geo-spatial applications, marketing and/or psychology | None | Online, inperson | F, Sp |


|  |  | NEW ACADEMIC PROGRAM-GRADUATE MAJOR |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| THE UNIVERSITY OF ARIZONA |  |  |  |  |  |  |
| INFO 531 | 3 | Data <br> Warehousing and Analytics in the Cloud | Data Warehousing and Analytics In the Cloud will utilize concepts, frameworks, and best practices for designing a cloud-based data warehousing solution and explore how to use analytical tools to perform analysis on your data. In the first half of the course, I will provide an overview of the field of Cloud Computing, its main concepts, and students will get hands-on experience through projects <br> which utilize cloud computing platforms. In the second half of the course, we will examine the construction of a cloud-based data warehouse system and explore how the Cloud opens up data analytics to huge volumes of data. | Familia <br> rity <br> with <br> databas <br> concep <br> ts and <br> basic <br> SQL <br> syntax | Online, inperson | F, Sp, Su |
| INFO 536 | 3 | Data Science <br> and Public <br> Interest | This course focuses on the use of modern data science methods to help learners make socially responsible decisions and mitigate harm that arises from issues like bias, discrimination, and threats to one's personal privacy. More and more individuals are needing to make data-driven decisions in a wide variety of contexts including nongovernmental organizations, not-forprofit industries, human services, environmental organizations, refugee camps, and more. Students in this class will thus learn about data science and how it can be utilized in contexts where socially-good decisions are desired and emphasized. This active learning class is designed for students who | None | Online, inperson | F, Sp |


|  |  | NEW ACADEMIC PROGRAM-GRADUATE MAJOR |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| The University OF ARIZONA |  |  |  |  |  |  |
|  |  |  | have an interest in the topic but who may have little to no previous experience with data science or programming. |  |  |  |
| INFO 539 (LING 539, CSC 539) | 3 | Statistical <br> Natural <br> Language <br> Processing | This course introduces the key concepts underlying statistical natural language processing. Students will learn a variety of techniques for the computational modeling of natural language, including: n-gram models, smoothing, Hidden Markov models, Bayesian Inference, Expectation Maximization, Viterbi, Inside-Outside Algorithm for Probabilistic ContextFree Grammars, and higher-order language models. Graduate-level requirements include assignments of greater scope than undergraduate assignments. In addition to being more in-depth, graduate assignments are typically longer and additional readings are required. | $\begin{aligned} & \text { LING } \\ & 538 \end{aligned}$ | Online, inperson | F |
| INFO 555 | 4 | Applied Natural Language Processing | Most of web data today consists of unstructured text. This course will cover the fundamental knowledge necessary to organize such texts, search them a meaningful way, and extract relevant information from them. This course will teach natural language processing through the design and development of end-toend natural language understanding applications, including sentiment analysis (e.g., is this review positive or negative?), information extraction (e.g., extracting named entities and their relations from text), and question answering (retrieving exact answers to natural language | $\begin{aligned} & \text { ISTA } \\ & 455 \end{aligned}$ | Online, inperson | Sp |


|  |  |  | questions such as "What is the capital of France" from large document collections). We will use several natural language processing toolkits, such as NLTK and Stanford's CoreNLP. The main programming language used in the course will be Python, but code written in Java or Scala will be accepted as well. Graduate-level requirements include implementing more complex, state-of-the-art algorithms for the three proposed projects. This will require additional reading of conference papers and journal articles. |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| INFO 556 | 3 | Text Retrieval and Web Search | Most of the web data today consists of unstructured text. Of course, the fact that this data exists is irrelevant, unless it is made available such that users can quickly find information that is relevant for their needs. This course will cover the fundamental knowledge necessary to build such systems, such as web crawling, index construction and compression, boolean, vector-based, and probabilistic retrieval models, text classification and clustering, link analysis algorithms such as PageRank, and computational advertising. The students will also complete one programming project, in which they will construct one complex application that combines multiple algorithms into a system that solves real-world problems. Graduate level requirements include implementing more complex, state-of-the-art algorithms for the programming project, which might require additional reading of research articles. Written | $\begin{aligned} & \text { ISTA } \\ & 456 \end{aligned}$ | Online, inperson | F |


|  |  | NEW ACADEMIC PROGRAM-GRADUATE MAJOR |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| THE UNIVERSITY of Arizona |  |  |  |  |  |  |
|  |  |  | assignments will have additional questions for graduate students. |  |  |  |
| INFO 557 | 3 | Neural Networks | Neural networks are a branch of machine learning that combines many simple computational units to allow computers to learn from and generalize over complex patterns in data. Students in this course will learn how to train and optimize feed forward, convolutional, and recurrent neural networks for tasks such as text classification, image recognition, and game playing. | Basic progra mming skills and some experie nce with analysis of algorith ms and data structu res. Basic linear algebra skills recom mende <br> d. | Online, inperson | Sp |
| INFO 570 | 3 | Database <br> Development <br> and <br> Management | This course covers theory, methods, and techniques widely used to design and develop a relational database system and students will develop a broad understanding of modern database management systems. applications of fundamental database principles in a stand-alone database environment using MS Access and Windows are emphasized. Applications in an Internet environment will be discussed using MySQL in the Linux platform. Graduate-level requirements include a group project | None | Online, inperson | F, Sp |

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|  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |


|  |  | NEW ACADEMIC PROGRAM-GRADUATE MAJOR |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| The University OF ARIZONA |  |  |  |  |  |  |
|  |  |  | should be appropriate for a 3-unit course. The primary faculty advisor must be an SI faculty, but faculty members from other units may participate in advising the student. |  |  |  |
| LING 578 | 3 | Speech Technology | Topics include speech synthesis, speech recognition, and other speech technologies. This course gives students background for a career in the speech technology industry. Graduate students will do extra readings, extra assignments, and have an extra presentation. Their final project must constitute original work in a speech technology. |  | Online, inperson | Sp |
| LING 581 | 3 | Advanced Computational Linguistics | This course provides a hands-on project-based approach to particular problems and issues in computational linguistics. | $\begin{array}{\|l\|l} \hline \text { LING } \\ 538 \end{array}$ | Online, inperson | Sp |
| LING 582 | 3 | Advanced <br> Statistical <br> Natural <br> Language <br> Processing | This course focuses on statistical approaches to pattern classification and applications of natural language processing to real-world problems | $\begin{array}{\|l\|l} \hline \text { LING } \\ 539 \end{array}$ | Online, inperson | F |
| SIE 530 | 3 | Engineering Statistics | Statistical methodology of estimation, testing hypotheses, goodness-of-fit, nonparametric methods and decision theory as it relates to engineering practice. Significant emphasis on the underlying statistical modeling and assumptions. Graduate-level requirements include additionally |  | Online, inperson | F |




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V. NEW COURSES NEEDED - using the table below, list any new courses that must be created for the proposed program. If the specific course number is undetermined, please provide level (ie CHEM $6^{* *}$ ). Add rows as needed. Is a new prefix needed? If so, provide the subject description so Curricular Affairs can generate proposed prefix options.

| Course prefix and number | Units | Title | Course Description | Prereq | Modes of delivery | Typically Offered |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| INFO 526 <br> Under Curr. <br> Review (since Jan 2021) | 3 | Data Visualization | This course provides an overview of the various concepts and skills required for effective data visualization. It presents principles of graphic design, programming skills, and statistical knowledge required to build compelling visualizations that communicate effectively to target audiences. Visualization skills addressed in this course include choosing appropriate colors, shapes, variable mappings, and interactivity based on principles of color perception, pre-attentive processing, and accessibility. | None | Online, inperson | F, Sp |
| INFO 579 <br> In Dev. (D) | 3 | Database Design in SQL | The course provides students with training in writing basic queries in the structured query language (SQL). Upon completion of this course, students will have an | None | Online, inperson | F, Sp |


VI. FACULTY INFORMATION- complete the table below. If UA Vitae link is not provided/available, attach a short CV (2-3 pages) to the end of the proposal or upload to the workflow form (in the "Letter(s) of Support" field). UA Vitae profiles can be found in the UA directory/phonebook.

| Faculty Member | Involvement | UA Vitae link or "CV attached" |
| :---: | :---: | :---: |
| Steven Bethard | iSchool, Teaches NLP, Neural Networks, and other data science courses | https://profiles.arizona.edu/person/bet hard |
| Hong Cui | iSchool, Teaches INFO 523, Data Mining | https://profiles.arizona.edu/person/ho ngcui |
| Gregory Ditzler | ECE, Teaches data science courses | https://profiles.arizona.edu/person/dit zler |
| Bruce Fulton | iSchool, Teaches INFO 570 <br> Database Development and Management | https://profiles.arizona.edu/person/bfu Iton |
| Gus Hahn-Powell | Linguistics, Teaches NLP | https://profiles.arizona.edu/person/ha hnpowell |
| Mike Hammond | Linguistics, Teaches Speech Technology | https://profiles.arizona.edu/person/ha mmond |
| John Hartman | Computer Science, Teaches data science courses | https://profiles.arizona.edu/person/jhh |

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| Bryan Heidorn | iSchool, Teaches data science courses | https://profiles.arizona.edu/person/hei dorn |
| :---: | :---: | :---: |
| Peter Jansen | iSchool, Teaches NLP and other data science courses | https://profiles.arizona.edu/person/paj ansen |
| Chris Lukeinbeal | Geography and Development, Teaches Geographic Info Systems | https://profiles.arizona.edu/person/clu kinbe |
| Clayton Morrison | iSchool, Teaches machine learning and other data science courses | https://profiles.arizona.edu/person/cla ytonm |
| Jason Pacheco | Computer Science, Teaches data science courses | https://www2.cs.arizona.edu/~pacheco i/ |
| Adriana Picoral | iSchool, Teaches data visualization and other data science courses, developing a new core course for the degree plan. | https://ischool.arizona.edu/sites/ischoo l.arizona.edu/files/Picoral_cv.pdf |
| Ryan Rucker | iSchool, Teaches INFO 570 Database Development and Management | https://ischool.arizona.edu/sites/ischoo l.arizona.edu/files/Ryan\%20Rucker\%20 CV.pdf |
| Young-Jun Son | SIE, Professor and Department Head | https://profiles.arizona.edu/person/son |
| Meaghan Wetherell | iSchool, Teaches a variety of data science courses. | https://ischool.arizona.edu/sites/ischoo l.arizona.edu/files/CV\%20 07022020\% 20 Meaghan\%20Wetherell.pdf |
| Chicheng Zhang | Computer Science, Teaches a variety of data science courses. | https://zcc1307.github.io/ |

NOTE: as additional elective certificates are brought into the program this list will grow and will be submitted through the proper channels.

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VII. SAMPLE PLAN OF STUDY- provide a sample plan of study.

## Fall - Spring - Summer - Fall Plan (1.5 years)

Fall: INFO 520 Ethical Issues in Information and INFO 523 Data Mining and Discovery

Spring: INFO 526 Data Visualization, elective/certificate course \#1, elective/certificate course \#2

Summer: elective/certificate course \#3 and elective/certificate course \#4

Fall: elective/certificate course \#5, elective/certificate course \#6 and capstone project

## Fall - Spring - Fall - Spring Plan (2 years)

Fall: INFO 520 Ethical Issues in Information and INFO 523 Data Mining and Discovery

Spring: INFO 526 Data Visualization, elective/certificate course \#1, elective/certificate course \#2

Fall: elective/certificate course \#3 and elective/certificate course \#4, elective/certificate course \#5

Spring: elective/certificate course \#6 and capstone project
VIII. STUDENT LEARNING OUTCOMES AND CURRICULUM MAP—describe what students should know, understand, and/or be able to do at the conclusion of this major. Work with Office of Instruction and Assessment to create a curricular map using Taskstream. Include your curricular map in this section (refer to Appendix C for sample Curriculum Map generated using Taskstream).

This M.S. in Data Science is intended to produce graduates who are knowledgeable in data science practices and have working skills that make them top candidates for data scientist positions. This degree will prepare students to participate in solving significant societal problems, whether within Arizona or globally, and to work effectively across disciplinary boundaries in a variety of careers in the public or private sectors.

Topics covered:

Dealing with Data
Types of Data

Data Quality and Preprocessing

Ethical Issues in Data Science

Managing, Storing, Preserving Data
Making Data Findable and Useable for People

Parametric and non-parametric statistical models

Machine Learning

Classification

Regression

Clustering

Data Visualization

Plots

Maps

Interactivity

## Curriculum Map:

Shared as an individual document.

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IX. ASSESSMENT PLAN FOR STUDENT LEARNING- using the table below, provide a schedule for program assessment of intended student learning outcomes 1) while students are in the program and 2) after completion of the degree.

| Learning Outcomes | Sources(s) of Evidence | Assessment Measures | Data Collection Points |
| :---: | :---: | :---: | :---: |
| DS1: Students will demonstrate skills in processing and analyzing data. | Course-embedded assessments in INFO 523, the Capstone Project, and in several of the other course choices. | Exams, papers, created material, and other forms of student work | During each course, end of each course, and capstone team project. |
| DS2: Students will communicate with and effectively work and interact in teams. | Course-embedded assessments in INFO 523, the Capstone Project, and in several of the other course choices. | Group projects, oral and written communication assignments, final projects. | During each course, end of each course, and capstone team project. |
| DS3: Students will demonstrate abilities in analyzing ethical concerns and societal impacts related to data science. | Course-embedded assessments in INFO 520 , and in several of the other course choices. | Exams, papers, and other forms of student work <br> Summative critical selfreflections | During each course, end of each course, and capstone team project. |

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X. PROGRAM ASSESSMENT PLAN- using the table below, provide a schedule for program evaluation 1) while students are in the program and 2) after completion of the degree.

| Assessment Measure | Source(s) of Evidence | Data Collection Point(s) |
| :--- | :--- | :--- |
| Job placement statistics | Student/alumni <br> surveys | At graduation and as part of <br> alumni survey |
| Academic program review | Reviewers' responses | Every 7 years |
| Student interest | Enrollment numbers | Every year |
| The School's academic <br> success | National ranking | Every year |

XI. ANTICIPATED STUDENT ENROLLMENT- complete the table below. What concrete evidence/data was used to arrive at the numbers?

|  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  | $1^{\text {5t }}$ Year |  |  |  |  |

Data/evidence used to determine projected enrollment numbers:
Projections are based on iSchool growth generally, a set of sample enrollment trends in similar degree programs across iSchools, and then we used an average of these numbers in our estimations.
XII. ANTICIPATED DEGREES AWARDED- complete the table below, beginning with the first year in which degrees will be awarded. How did you arrive at these numbers? Take into consideration departmental retention rates. Use National Center for Education Statistics College Navigator to find program completion information of peer institutions offering a same or similar program.

|  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| PROJECTED DEGREES AWARDED ANNUALLY |  |  |  |  |  |
|  | $1^{\text {st }}$ Year | $2^{\text {nd }}$ Year | $3^{\text {rd }}$ Year | $4^{\text {th }}$ Year | $5^{\text {th }}$ Year |
| Number of <br> degrees | $n / a$ | 45 | 90 | 180 | 360 |

Data/evidence used to determine number of anticipated degrees awarded annually:
Projections are based on MS degrees, iSchool growth, and enrollment nationally. iSchool enrollment is among the fastest growing in many universities. We are expecting a high retention rate in the program, due to the high demand for and retention in our own current graduate level MS Information program and other similar data science-oriented programs across the campus.

General Demand
Students, generally, are living amid a massive shift in the amount of data we can save, use, analyze, and visualize the Arizona region and students nationally thus need to be prepared for life and work in this data-driven economy:

- The data volumes are exploding; more data has been created in the past two years than in the entire previous history of the human race.
- Data is growing faster than ever before and by the year 2020, about 1.7 megabytes of new information will be created every second for every human being on the planet.
- By then, our accumulated digital universe of data will grow from 4.4 zettabyets today to around 44 zettabytes, or 44 trillion gigabytes.
- Every second we create new data. For example, we perform 40,000 search queries every second (on Google alone), which makes it 3.5 searches per day and 1.2 trillion searches per year.
- In Aug 2015, over 1 billion people used Facebook FB $+1.31 \%$ in a single day.
- $\quad$ Facebook users send on average 31.25 million messages and view 2.77 million videos every minute.


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- We are seeing a massive growth in video and photo data, where every minute up to 300 hours of video are uploaded to YouTube alone.
- In 2015, a staggering 1 trillion photos will be taken and billions of them will be shared online. By 2017, nearly $80 \%$ of photos will be taken on smart phones.

Source: http://www.forbes.com/sites/bernardmarr/2015/09/30/big-data-20-mind-boggling-facts-everyone-mustread/\#22f2f71c6c1d

Related Positions:

Artificial Intelligence Engineer
Business Analyst
Business Data Analyst
Business Intelligence Analyst
Business Intelligence Engineer
Data Associate
Data Analyst
Data Architect
Data Engineer
Data Scientist
Language Engineer
Machine Learning Engineer
Machine Learning Scientist
Market Research Analyst
Predictive Analytics Professional
Research Scientist

Local worksites for data-trained students include:

Apple Computer
Adobe
AdviNow Medical
Air Force Research Labs (Mesa AZ)
American Express
Databricks
IBM
Leidos
Lum AI
OpenClass
Pitch Vantage
State Farm
XIII. PROGRAM DEVELOPMENT TIMELINE- describe plans and timelines for 1) marketing the program and 2)student recruitment activities.

This program will be marketed alongside our other degree programs. As an iSchool we invest in event sponsorships so that we can hand out flyers and other marketing materials, we attend conferences, and advertise in print outlets and on the radio across Arizona. We plan to directly recruit students in and from locations such as:

- Existing undergraduate programs across the campus.
- UA events like the UA hackathon, or community events like TenWest.
- Social media
- The iSchool already collaborates with a number of cross-campus data science groups (e.g., the Data Science Institute, Cyverse) and aims to work collaboratively with those units for the purposes of advertising, recruitment, etc.

Upon approval, the School of Information will begin marketing and recruiting efforts immediately, accepting majors as soon as the program is approved.
XIV. DIVERSITY AND INCLUSION-describe how you will recruit diverse students and faculty to this program. In addition, describe retention efforts in place or being developed in order to retain students.

Student diversity in recruitment will be ensured through outreach activities that target college campuses that serve underrepresented student populations. The Curriculum and Instruction Committee will aim to increase diversity among the accepted students. Program information will be highlighted on the iSchool website, so that prospective students easily find it. The University of Arizona's diversity initiatives will be made visible on the website as well, with links that direct prospective students to these resources, so that they become aware of an existing support network for diversity and inclusion. Social media posts that aim to increase awareness about the proposed program will also encourage diversity. Outreach activities such as programming workshops have been held by iSchool faculty in the UAZ library, in the iSchool, and in other venues both on and off campus. These activities will be continued, as they help in increasing diversity and inclusion, in addition to outreach. We believe the current diverse student population of the iSchool will also encourage diverse student populations to apply. The 2019 racial composition of the iSchool was roughly $53 \%$ white, $19 \%$ Hispanic, $8 \%$ international, $7 \%$ Asian, $5 \%$ two or more races 5\%, American Indian 1\%, less than $1 \%$ unknown, less than 1\% Pacific Islander. The iSchool's Knowledge River program, which aims to increase and maintain diversity will be another important factor in supporting and getting word out to underrepresented students. With all of these mentioned efforts, equitable access to the program will be ensured for a diverse and qualified pool of candidates, such as ethnic minorities and first generation and low-income students. Moreover, for the enrolled students, a nondiscriminatory and inclusive environment will always be maintained to provide support for students and increase their sense of belonging. To ensure an inclusive climate, diversity will also be emphasized in hiring of new faculty. Existing faculty will be encouraged to use inclusive materials in their courses and encourage their students to use inclusive materials in their coursework as well.

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XV. ABOR REQUIREMENT: New Academic Program Request. This section is required by ABOR. Most of the information can be copied/pasted from completed sections above. Instructions/clarification for completing the table below, from ABOR, can be viewed/downloaded here.

University: University of Arizona

| Name of Proposed Academic Program: |
| :--- |
| M.S. program in Data Science |
| Academic Department: |
| School of Information |
| Geographic Site: |
| Arizona Online |
| Instructional Modality: |
| Online |
| Total Credit Hours: |
| 30 |
| Proposed Inception Term: |
| Fall 2021 |

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Brief Program Description:

Through transdisciplinary stacked certificate curriculum, the MS in Data Science program produces generations of professionals and researchers who have the knowledge, skill, and ability to engage in data science processes and work. This degree will encompass a blend of disciplines to address the grand challenges of today and the future. The MS in Data Science provides students the training they need in data collection, exploration, manipulation and storage, analysis, and presentation in order to navigate data-rich workplace environments.

Learning Outcomes and Assessment Plan:
DS1: Students will demonstrate skills in processing and analyzing data.

DS2: Students will communicate with and effectively work and interact in teams.

DS3: Students will demonstrate abilities in analyzing ethical concerns and societal impacts related to data science.

Student Learning Outcomes will be assessed annually through:

- Data-related projects, presentations, and visualizations produced relative to students' coursework.
- Regular survey of skills, abilities, and responsibilities of program graduates and employers of the graduates.

Projected Enrollment for the First Three Years:

of Arizona

## Evidence of Market Demand:

The proposed MS in Data Science program will support the priorities outlined in the UA's Strategic Plan. Enhancing the supply of well-trained leaders in the data sciences will help catalyze economic development in the state of Arizona. Built upon the foundations of probability theory, optimization, as well as algorithmic thinking and doing, the data sciences include a broad set of approaches to include bioinformatics, natural language processing, machine learning, data mining, data visualization, and more.

According to U.S. News, Data Scientist jobs are 8 out of 100 best jobs in the United States. With a median salary of $\$ 94,280$ and a $3.5 \%$ unemployment rate, this newer career field is increasingly recognized by employers as a valuable asset to their companies (Data Scientist Ranks Among Best Jobs of 2021, n.d.) The Bureau of Labor Statistics projects 31 percent employment growth for data scientists between 2019 and 2029 (Fastest Growing Occupations: Occupational Outlook Handbook, 2020).

Similar Programs Offered at Arizona Public Universities:
NAU has a Data Science graduate certificate (but not a full MS):
http://catalog.nau.edu/Catalog/details?plan=INFDSCT\&catalogYear=2021
ASU has:
Master of Science in Business Data Analytics https://asuonline.asu.edu/online-degree-programs/graduate/master-science-business-analytics/

Master of Computer Science (Big Data Systems)
https://asuonline.asu.edu/online-degree-programs/graduate/master-big-data/
Master of Science in Program Evaluation and Data Analytics
https://asuonline.asu.edu/online-degree-programs/graduate/program-evaluation-and-data-analytics-ms/

New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):
There are not external funds available for this M.S. program at this time, however a committee will be formed to provide focus on seeking external funds to support the School.

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Program Fee/Differentiated Tuition Required? No

Specialized Accreditation? No

University of Arizona AMS

## DEMO AREA

## MS Data Science

Courses and Activities Mapped to MS Data Science

|  | Outcome |  |  |
| :---: | :---: | :---: | :---: |
|  | DS1 <br> Students will demonstrate skills in processing and analyzing data. | DS2 <br> Students will communicate with and effectively work and interact in teams. | DS3 <br> Students will demonstrate abilities in analyzing ethical concerns and societal impacts related to data science. |
| Courses and Learning Activities |  |  |  |
| INFO 520 Ethical Issues in Information Course assignments |  | IPA | IPA |
| INFO 521 Introduction to Machine Learning Course assignments | IPA |  |  |
| INFO 523 Data Mining and Discovery Course assignments | IPA |  | IPA |
| INFO 526 <br> Data Visualization (New Course) Course assignments | IPA | IPA | IPA |
| Capstone Course assignments | A | A | A |
| Survey <br> Exit survey (Indirect) | A | A | A |
| Legend : In In | d Pract | A Assessed | I/P Introduced/Prac |

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Graduate Major Peer Comparison Chart - select two peers for completing the comparison chart from (in order of priority) ABOR-approved institutions, AAU members, and/or other relevant institutions recognized in the field. The comparison chart will be used to identify typically required coursework, themes, and experiences for majors within the discipline. The comparison programs are not required to have the same degree type and/or major name as the proposed UA program. Information for the proposed UA program must be consistent throughout the proposal documents.

| Program name | Proposed UA Program: M.S. <br> Data Science | Peer 1: <br> Master of Information and <br> Data Science <br> UC Berkeley <br> School of Information | Peer 2: <br> M.S. <br> Data Science <br> University of Wisconsin |
| :---: | :---: | :---: | :---: |
| Current \# of enrolled students |  | 792 | 393 |
| Major Description. | The MS in Data Science will provide students the confidence and training they need in data collection, exploration, manipulation and storage, analysis, and presentation in order to navigate data-rich workplace environments. The degree will signal to employers that students have dedicated the time and energy necessary to develop the skills and confidence for tackling messy data problems using modern programming languages. The degree will service a diverse student population, training both 1 ) technically-minded students the nuances associated with successfully developing and communicating data methods and results, and 2) | The online Master of Information and Data Science (MIDS) is designed to educate data science leaders. The professional degree program prepares students to derive insights from real-world data sets, use the latest tools and analytical methods, and interpret and communicate their findings in ways that change minds and behaviors. The program features a multidisciplinary curriculum that draws on insights from the social sciences, computer | In the competitive world of data science, a master's degree is a requirement for advanced positions at top companies. The online UW Master of Science in Data Science is a smart choice for busy adults who want to advance their careers-or start a whole new career-but don't have time for oncampus courses. This data science master's program will teach you how to harness the power of big data using the latest tools and analytical methods. Courses are taught by diverse and |


|  | less technically-minded students the basic skills necessary for gathering insights from data. | science, statistics, management, and law. | distinguished faculty from across the University of Wisconsin System. <br> Tuition for the program is a flat fee of $\$ 850$ per credit whether you live in Wisconsin or out of state, and financial aid is available for students who qualify. <br> Because the program is entirely online, you can study and do homework whenever you like, wherever you have an Internet connection. Courses have no set meeting times and you never need to come to campus. An innovative Virtual Lab lets you remotely access software tools and programming languages such as $R$, Python, SQL Server, and Tableau, saving you the cost, time, and hassle of purchasing and installing these applications on your own computer. |
| :---: | :---: | :---: | :---: |
| Target careers | Artificial Intelligence Engineer <br> Business Analyst <br> Business Data Analyst <br> Business Intelligence Analyst <br> Business Intelligence Engineer <br> Data Associate | Data scientist <br> Data analyst <br> Data engineer | Data scientist careers in health care, computer science, information technology, retail, marketing, manufacturing, transportation, communication, education, insurance, finance, science, security, law enforcement, and more. |


|  | Data Analyst <br> Data Architect <br> Data Engineer <br> Data Scientist <br> Language Engineer <br> Machine Learning Engineer <br> Machine Learning Scientist <br> Market Research Analyst <br> Predictive Analytics <br> Professional <br> Research Scientist |  |  |
| :---: | :---: | :---: | :---: |
| Total units required | 30 | 27 | 36 |
| Pre-admission expectations (i.e. academic training to be completed prior to admission) | Applicants are expected to have completed undergraduate coursework in statistics. Coursework in calculus preferred but not required. The application will have 2 explicit questions asking the applicant to list coursework or professional experience that meets these criteria. <br> 1. What academic coursework and/or professional experience demonstrates your strong quantitative and analytical reasoning abilities? <br> 2. What academic coursework and/or professional experience demonstrates your experience with math and programming, including data structures, analysis of | To be eligible for the online master's program, you must meet the following requirements: <br> - A bachelor's degree and a GPA above 3.0. <br> - A high level of quantitative ability. This should be demonstrated by at least one of the following qualifications: <br> - Work experience that demonstrates your quantitative abilities <br> - Academic coursework that demonstrates | You may be eligible for admission to this program if you have completed a bachelor's degree with a 3.0 or better grade point average (GPA) and prerequisite courses in elementary statistics, computer programming, and database administration. |

## algorithms, and linear algebra?

quantitative aptitude

- A working knowledge of fundamental concepts. For the MIDS program, this includes knowledge of data structures, algorithms and analysis of algorithms, and linear algebra. Applicants who lack this experience in their academic or work background but meet all other requirements for admission will be asked to complete a bridge course before enrolling in the Applied Machine Learning course.
- Proficiency in programming languages, such as Python or Java, should be demonstrated by prior work experience or advanced coursework. Applicants who lack this experience in their academic or work background but meet all other admission requirements will be required to take the Introduction to Data Science Programming course in their first term.


## Major requirements

## List all major

 requirements including core and electives.| Core - four courses | Foundation Courses: <br> Introduction to Data | $\begin{aligned} & \text { DS 700: Foundations of } \\ & \text { Data Science } \end{aligned}$ |
| :---: | :---: | :---: |
| INFO 520 Ethical Issues in Information | Science Programming (3 Units) | $\begin{aligned} & \text { DS 705: Statistical } \\ & \hline \text { Methods } \end{aligned}$ |
| INFO 521 Introduction to Machine Learning | Research Design for | DS 710: Programming for Data Science |
| INFO 523 Data Mining and Discovery | Application for Data and Analysis (3 Units) | DS 715: Data Warehousing |
| INFO 526 Data Visualization (New Course) | Statistics for Data Science | $\frac{\text { DS 730: Big Data: High- }}{\frac{\text { Performance Computing }}{\text { (Prerequisite: DS 710) }}}$ |
| Electives - choose five courses from this set | (3 Units) | DS 735: Communicating About Data |
| ECE 523 Machine Learning | Fundamentals of Data |  |
| ECE 524 Fundamentals of Cloud Security | Engineering (3 Units) | Machine Learning <br> (Prerequisites: DS 705 and DS 710) |
| ECE 579 Artificial | Applied Machine Learning | DS 745: Visualization and |
| Intelligence | (3 Units) | Unstructured Data Analysis |
| INFO 514/POL 514 |  | (Prerequisites: DS 700 and |
| Computational Social | Advanced Courses: | DS 740) |
| Science <br> INFO 531 Data Warehousing and Analytics in the Cloud | Experiments and Causal Inference (3 Units) | DS 760: Ethics of Data Science (Prerequisites: DS 700 or DS 780) |
| INFO 536 Data Science and Public Interests | Behind the Data: Humans and Values (3 Units) | DS 775: Prescriptive <br> Analytics (Prerequisite: DS 705) |
| INFO 555 Applied Natural Language Processing |  | DS 780: Data Science and Strategic Decision Making |
| INFO 556 Text Retrieval and Web Search | and at the Edge (3 Units) | DS 785: Capstone <br> (Prerequisites: DS 715, DS |
| INFO 557 Neural Networks | Statistical Methods for | $\frac{730, ~ D S ~ 735}{\text { DS } 775)}, \underline{D S 45,} \text { and }$ |
| INFO 570 Database | Discrete Responses, Time |  |
| Development and Management | Series, and Panel Data (3 |  |
|  | Units) |  |
| Presentation | Machine Learning at Scale (3 Units) |  |


| LING 508 Computational |  |
| :--- | :--- |
| Techniques for Linguists | Natural Language |
| LING/CSC/INFO 539 | Processing with Deep |
| Statistical Natural Language | Learning (3 Units) |
| Processing |  |
| LING 582 Advanced |  |
| Statistical Natural Language | Data Visualization (3 Units) |
| Processing |  |
| SIE 530: Engineering | Capstone Course ( 3 Units) |
| Statistics |  |
| SIE 533: Fundamentals of |  |
| Data Science for Engineers |  |
| SIE 545 Fundamentals of |  |
| Optimization |  |
| SIE 640 Large-Scale |  |
| Optimization |  |
| SIE 645 Nonlinear |  |
| Optimization |  |
|  |  |


| Research methods, data analysis, and methodology requirements (Yes/No). If yes, provide description. | Research course embedded in the set of core required courses. | Research course embedded in the set of core required courses. | Research course embedded in the set of core required courses. |
| :---: | :---: | :---: | :---: |
| Internship, practicum, applied course requirements (Yes/No). If yes, provide description. | Yes. <br> Three capstone units are required. Students will complete a project that shows their mastery of data science skills. | Yes. <br> MIDS students complete a capstone by executing a culminating project that integrates the core skills and concepts learned throughout the program. The capstone combines the technical, analytical, interpretive, and social dimensions required to design and execute a full data science project. Students learn integral skills that prepare them for long-term professional success in the field. | Yes. <br> Capstone units required as part of the core curriculum. <br> Capstone course in which students will develop and execute a project involving real-world data. Projects will include: formulation of a question to be answered by the data; collection, cleaning and processing of data; choosing and applying a suitable model and/or analytic method to the problem; and communicating the results to a non-technical audience. |
| Master thesis or dissertation required (Yes/No). If yes, provide description. | No | No | No |
| Additional requirements (provide description) |  |  |  |



April 11, 2021
Dear Curricular Review Committees,
This is a letter of support for the use of the School of Geography, Development and Environment's (SDGE), Geographic Information Systems and Technology (GIST) courses in the new Data Science M.S. (MS-DS) program.

SGDE supports the development of a MS-DS degree and our curriculum committee will be reviewing the best ways to participate using its current selection of GIST data science courses. SGDE can immediately participate in the success of the MS-DS program through the use of the Professional GIST (P-GIST) certificate which now allows any 3 graduate classes in GIST to be a certificate. We attach the list of courses for the P-GIST certificate.

Our curriculum committee is planning to review the use of the P-GIST and the possibility of creating a new geospatial data science (GDS) certificate in Fall 2021. The P-GIST or GDS certificate can be an option for the MS Data Science students and we hope the changes will be routed and reviewed in time for a spring 2022 launch. We note that a new data science faculty member is joining us in Fall 2021 - Beth Tellman who is an expert in the use of large data sets, including remote sensing, for earth system and flood analysis and was hired as part of the university-wide data science initiative.

We look forward to this and other collaborative efforts between our units.
Certificate 3: Database Management (School of Information and School of Geography, Development and Environment)
INFO 579: Database Design in SQL (under review/forthcoming)
INFO 570: Database Development and Management
GIST 570: Geodatabase (new course forthcoming)
Certificate 4: Geospatial Data Science (School of Geography, Development and Environment)
GIST 516e: Geovisualization
GIST 603A: Geographic Information Systems Programming and Automation
GIST 604B: Open Source GIS

Yours Sincerely,


Diana Liverman
Regents Professor
Director School of Geography, Development, and Environment

## PGIST

## P-GIST students can select 3 courses from the list below with the advance approval from a GIST advisor.

## Course Descriptions

GIST 601A: Geographic Information Science (3 units)
This course will introduce the fundamental concepts of geographic information systems technology (GIST). It will emphasize equally GISystems and GIScience. Geographic information systems are a powerful set of tools for storing, retrieving, transforming and displaying spatial data from the real world for a particular set of purposes. In contrast, geographic information science is concerned with both the research on GIS and with GIS. As Longley et al. (2001, vii) note, "GIS is fundamentally an applications-led technology, yet science underpins successful applications." This course will combine an overview of the general principles of GIScience and how this relates to the nature and analytical use of spatial information within GIS software and technology. Students will apply the principles and science of GIST through a series of practical labs using ESRI's ArcGIS software.

GIST 601B: Remote Sensing Science (3 units)
This course provides an introduction to the scientific principles and practices of remote sensing. Topics that will be covered in this course include issues of spatial resolutions, the electromagnetic spectrum, remotely sensed sensors, spectral characteristics, digital and digitalization issues, multispectral and LiDAR image processing and enhancement, and land-use and land-cover classifications (LULC) and change detection. The course also emphasizes integration issues and analysis techniques that arise when merging remotely sensed data with geographic information systems (GIS).

## GIST 602A: Raster Spatial Analysis (3 units)

This course examines the principles and practices associated with raster data development and analysis, particularly the development of real world surfaces and statistical analysis based on these surfaces. The course is presented in a lecture/laboratory format. The lecture portion will deal with conceptual issues necessary for the use of raster approaches within a GIS framework. The laboratory portion will provide practical experience with rasters in an ArcGIS environment.

GIST 602B: Vector Spatial Analysis (3 units)
This course focuses on providing students with an introduction vector based spatial analysis and their application in GIS software. Students will learn about how to analyze distribution, direction, orientation, clustering, spatial relationships and processes, and how to render analytic outcomes into cartographic form. This course provides foundational knowledge of global positioning systems, data collection, geodatabase development, and georeferencing.

GIST 603A: Geographic Information Systems Programming and Automation (3 units)
The goal of this course is to gain an introductory understanding of geographic programming and data automation techniques using ModelBuilder and the Python language. Students will become familiar with the ModelBuilder tools inside ArcGIS for Desktop to automate redundant tasks using ModelBuilder and learn how to build a script using Python to customize functionality and task with GIS.

## GIST 603B: WebGIS (3 units)

The goal of this course is to gain an understanding of web mapping using applications like ArcGIS for Server, ArcGIS Online (AGOL), WebAppBuilder (WAB), web-enabled geoprocessing, Story Maps, AppStudio, and the Javascript API.

## GIST 604A: Applied GIS (3 units)

A GIST-based problem solving approach within the context of a student-directed project. Specific GIS skills covered include project planning, spatial data sources and acquisition, data compilation, coding, analysis, representation, and presentation of results. The course can be repeated for credit, as the topics will vary; each course will examine a different urban or environmental issue in the natural and social sciences using geographic information systems technology.

## GIST 604B: Open Source GIS (3 units)

This course provides students a brief introduction about Open Source software for both desktop and internet GIS applications. Main objective of the course is to expose students to alternative open source tools for practicing GIS besides licensed and conventional GIS software. Students will go through hands on learning about applications hosting, data development, processing, and sharing using open source tools and technologies such as GITHub, Quantum GIS (QGIS), Python, GeoServer and PostGIS. Students will apply technology in lab assignments using real-world data.

Systems \& Industrial Engineering Department

1127 E James E Rogers Way

January 25, 2021
Dear Curricular Review Committees,
This is a letter of support for the use of five of our Systems and Industrial Engineering (SIE) courses to begin as part of the new online Data Science M.S. program. We see the need for this new program at the University of Arizona, and it is a program we are happy to be a part of. In the near future we would like a chance to re-examine the curricular needs in the program so that we can refine the course plan based on further discussions among our faculty in those areas and also given the enrollment realities we face in certain courses.

There are many great opportunities for synergy between Systems and Industrial Engineering and the iSchool moving forward. So, we are delighted to collaborate across units for this effort.

Sincerely,


Young-Jun Son
Professor and Head of Department of Systems and Industrial Engineering

# ELECTRICAL \& COMPUTER ENGINEERING 

College of Engineering
1230 E. Speedway Blvd.
P.O. Box 210104

Tucson, AZ 85721-0104
Ofc: 520.621.6193
ece.engineering.arizona.edu

January 24, 2021

Dear Curricular Review Committees:
This is a letter of support for the use of our courses (ECE 523 Machine Learning, ECE 524 Fundamentals of Cloud Security, and ECE 579 Artificial Intelligence) in the new online Data Science M.S. program. We see the need for this new program at the University of Arizona, and it is a program we are happy to be a part of. There are many great opportunities for synergy between Electrical and Computer Engineering and the iSchool moving forward. So, we look forward to this and other collaborative efforts between our units.

Sincerely,


Tamal Bose
Professor and Department Head

DEPARTMENT
LINGUISTICS
College of Social \& Behavioral Science 1103 E. University Blvd PO Box 210025
Tucson AZ 85721-0025
Tel: 520-621-6897
Fax: 520-626-9017
http://linguistics.arizona.edu

January 22, 2021
Catherine Brooks
Director, School of Information
University of Arizona

Dear Dr. Brooks (Dear Catherine):
I am writing to state the Department of Linguistics' support for the proposed new online M.S. in Data Science program. We have discussed with you which Linguistics courses to include in the curriculum of the program, and we are in agreement. The proposal has the support of the Linguistics Curriculum Committee and the faculty who teach in this area. We look forward to collaborative work between this program and our own online M.S. in Human Language Technologies program.

Sincerely,


Natasha Warner
Professor and Department Head
Department of Linguistics

| From: | Sandoval, Liz - (esandmar) |
| :--- | :--- |
| To: | Sandoval, Liz - (esandmar) |
| Subject: | FW: Master"s degree in Data Science |
| Date: | Tuesday, April 13, 2021 11:18:24 AM |

From: Carnie, Andrew H - (carnie) [carnie@arizona.edu](mailto:carnie@arizona.edu)
Sent: Tuesday, April 13, 2021 11:13 AM
To: Sandoval, Liz - (esandmar) [esandmar@arizona.edu](mailto:esandmar@arizona.edu)
Subject: Re: Master's degree in Data Science

Hi Liz,

Best,

Andrew

Begin forwarded message:

From: "Cheu, Elliott C - (echeu)" [echeu@arizona.edu](mailto:echeu@arizona.edu)
Subject: Master's degree in Data Science
Date: April 13, 2021 at 8:51:48 AM MST
To: "Carnie, Andrew H - (carnie)" [carnie@arizona.edu](mailto:carnie@arizona.edu)

Hi Andrew,

The College of Science supports the creation of a new Master's Degree in Data Science offered by the School of Information.

Best regards,

Elliott Cheu, Ph.D.
Interim Dean, College of Science
Distinguished Professor of Physics
University of Arizona
(520) 621-4092

Submitted to the Members of the Faculty Senate on April 23, 2021
From: Dr. Todd Vanderah, Professor and Head, Department of Pharmacology Re: Proposed BS in Medicine

## Summary of Activities and Changes to Proposed BS in Medicine Following the April 5, 2021 Senate Meeting:

1. I made changes to some of the required courses (added MCAT/Med School course requirements). I investigated 28 medical schools in the West to Midwest as well as the MCAT requirements on the Excel sheet [enclosed]. I also included the BS in Medicine courses and highlighted in yellow what may (or may not) be needed.
2. I worked intensely on looking up job qualifications using websites like Indeed.com, and investigated the US Bureau of Labor Statistics, etc. to find out what type of medical jobs require a BS/BS degree, qualifications, growth of these jobs and starting pay. I am continuing to build this as it will be useful for our students if the BS in Medicine is approved.
3. I met with the majority of those who wrote letters of opposition to work on mitigating issues and in some cases came to resolution but in other cases, we were unable to come to a full agreement. For example, several faculty asked that we simply propose a minor (and not a BS degree) to see how well this would be accepted and offer "good working relationships with other programs". I have brought this idea to our team and administration and there was an overall vote of No - we would like to continue to pursue a BS in Medicine Program.
4. I recruited a medical (physician) faculty member from our team - Dr. Paul Gordon -to be a spokesperson(s) for the BS in Medicine program. Practicing physicians are better able to explain the differences and advantages that the BS in Medicine Program can offer.
5. I requested changing the name of the program to Medical Science and this was voted down. I had Administration in the Provost's Office look into the Legalities of the CIP code and the name BS in Medicine as being a legal name for this program as well.

Thanks,
Todd
Todd W. Vanderah
Professor and Head
Department of Pharmacology
Co-Director of the MD/PhD Program
Director of the Comprehensive Pain and Addiction Center

University of Arizona, COM

MCAT recommendations

| Gen Chem | labs | 2 semester |
| :--- | :--- | :--- |
| Organic chem/Biochem | labs | 2 semester |
| Biology | labs | 2 semester |
| Physicis | labs | 2 semester |
| Cell bio/MCB |  | 2 semester |
| Anatomy/Physiology |  | 2 semester |
| Statistics | 1 semester |  |
| Sociology | 1 semester |  |
| Psychology |  | 1 semester |

## Premedical School Requirements

## UofA COM-T

| Physiology | 2 semester |
| :--- | :--- |
| Biochemistry/genetics | 2 semester |
| Social \& Behavioral Sciences | 1 semester |
| Statistics | 1 semester |
| Upper- MCB, Cell Bio, Micro, Path, Pharm, Immuno | 2 semester |
| English | 2 semester |

## UofA COM-P

Physiology 1 semester
MCB, Cell Bio 2 semester
Biochemistry 1 semester
Chem 1 semester
Social \& Behavioral Sciences 2 semester
Statistics 1 semester
English 2 semester
Humanitites 1 semester

Univ of New Mexico
Biology + Lab 2 semester
Chemistry + Lab 2 semester
Organic Chemistry + Lab 2 semester
Biochemistry 1 semester
Physics 2 semester

Univ of Colorado
Physiology 2 semester
Chemistry 2 semester
Organic Chem 1 semester
Biochemistry/genetics 2 semester
Social \& Behavioral Sciences 1 semester
Statistics 1 semester

MCB, Cell Bio 2 semester
Physics

## Univ of Las Vegas

Biology + Lab
MCB, Cell Bio
Biochemistry
Social \& Behavioral Sciences

University of Nevada Reno SOM
Biology + Lab
Chemistry + Lab
Organic Chemistry + Lab
Biochemistry
Physics
MCB/Cell Bio/Genetics
Psychology

## Oregon State Univ

Biology
2 semester
Chemistry
Organic Chem
2 semester

Physics

## Oregon Health Sciences Univ

Biology 2 semester
Chemistry
Organic Chem/Biochem
MCB/Micro + Lab
Psychology
Statistics

Univ of Washington
Biology
2 semester
Chemistry
Organic Chem/Biochem
MCB
Psychology
Statistics
Sociology
Humanities/english
Physics
2 semester
1 semester
1 semester
1 semester
1 semester

## Washington State Univ

| Biology | 2 semester |
| :--- | :--- |
| Chemistry | 2 semester |
| Organic Chem | 2 semester |
| Cell Bio/Genetics | 1 semester |
| MicroBio + Lab | 1 semester |
| Biochemistry | 1 semester |
| Physics | 2 semester |

## UCLA

> Physiology

Biology/genetics
MCB, Cell Bio, Chem + Labs
Biochemistry
Physics + Lab
Social \& Behavioral Sciences
Statistics

USC

| Biology + Labs | 2 semester |
| :--- | :--- |
| Chemistry + Labs | 2 semester |
| Organic Chemistry + Labs | 2 semester |
| Physics + Labs | 2 semester |
| English | 2 semester |

UCSF

| Biology + Labs | 2 semester |
| :--- | :--- |
| Chemistry + Labs | 2 semester |
| Organic Chemistry + Labs | 2 semester |
| Physics + Labs | 2 semester |
| Biochemistry | 1 semester |

## UC San Diego

Biology + labs
2 semester
Chemistry + labs 2 semester
Organic Chemistry + labs 2 semester
Physics + labs
2 semester
Biochemistry
1 semester
Stats or Calculus 2 semester

## Stanford

Biology/Biochem
MCB, Cell Bio,
Chem + Labs
Physics + Labs
Social \& Behavioral Sciences
Statistics
English

## Univ. of Texas

Biology + labs 2 semester
Cell Bio/MCB 2 semester
Chemistry + labs 2 semester
Organic Chem + labs 1 semester
Biochem 1 semester
Physics + labs 2 semester
Statistics 1 semester
English 2 semester

Texas A\&M
Biology + labs 2 semester
Cell Bio/MCB 2 semester
Chemistry + labs 2 semester
Organic Chem + labs 2 semester
Biochem 1 semester
Physics + labs 2 semester
Statistics 1 semester
English 2 semester

## Kansas Univ

| Biology + Labs | 2 semester |
| :--- | :--- |
| Chemistry + Labs | 2 semester |
| Organic Chemistry + Lab | 2 semester |
| Physics + Labs | 2 semester |
| English | 2 semester |

Mayo Clinic (Alix School of Med) Scottsdale
Applicants to Mayo Clinic Alix School of Medicine must be on track to earn a ba Successful candidates will have a strong background in the life sciences and soc but as of the 2020-2021 admissions season, Mayo Clinic Alix School of Medicin

## California Northstate University

Biology + Labs 2 semester
Chemistry + Labs 2 semester

| Organic Chemistry + Lab | 2 semester |
| :--- | :--- |
| Physics + Labs | 2 semester |
| English | 2 semester |
| Statistics/math | 2 semester |
| Biochemistry | 1 semester |

## California University of Science and Medicine

Biology + Labs 2 semester
Chemistry/Biochem 2 semester
Physics + Labs
English
Statistics/math

Loma Linda University School of Medicine
Biology + Labs
Chemistry + Labs
Organic Chemistry + Lab
Physics + Labs
Biochemistry

UC Davis School of Medicne
Biology 2 semester
Chemistry
Organic Chemistry/Biochem
Physics
labs encouraged
UC Irvine School of Medicne
Biology
Chemistry
Organic Chemistry/Biochem
Physics
labs encouraged

University of Hawaii SOM
Biology + Labs
Chemistry + Labs
Organic Chemistry + Lab
Physics + Labs
Biochemistry
MCB
3 semester
2 semester
2 semester
2 semester

2 semester
2 semester
2 semester
2 semester
1 semester
1 semester

Biology + Labs
Chemistry + Labs
Organic Chemistry + lab
Physics + Labs
Biochemistry
Stats/Math

2 semester
2 semester
1 semester
2 semester
1 semester
2 semester

## University of North Dakota SOM

We do not have required prerequisite coursework.
Understanding of the natural science underpinnings of biomedical sciences incl
An understanding of foundational concepts of psychology, sociology, and behal

## University of Utah

Biology + Labs 2 semester
Chemistry + Labs 2 semester
Organic Chemistry + Lab 2 semester
Physics + Labs 2 semester
Biochemistry 1 semester
MCB 1 semester
Stats 1 semester

## BS in Medicine Proposal Requires:

ENGL 101 or 107 (3)
ENGL 102 or 108 (3)

2 courses/ 6 units- Tier I 150 (INDV)
2 courses/ 6 units-Tier I 160 (TRAD)
1 course/ 3 units-Tier II Arts
1 course/ 3 units-Tier II Humanities
1 course/ 3 units-Tier II Individuals and Societies

MATH 163 Basic Statistics (3 units). OR MATH 263, SBS 200, BME 376, AREC 239

CHEM 141 and 143/145 or CHEM 151 or General Chemistry I (4 units);
CHEM 142 and 144/146 or CHEM 152 or General Chemistry II (4 units);
CHEM 241A and 243A Organic Chemistry I and Lab (4 units); NOTE - for so
BIOC 384 Foundations in Biochem OR BIOC 385 Metabolic Biochemistry (3 units);

PHYS 141/142 Physics I and Lab (4 units);
PHYS 241/242 Physics II and Lab (4 units);

MCB 181R \& L Introduction to Biology \& Lab/ ECOL 181R \& L (4 units)
ECOL 182 Introductory Biology II (4 units)

PSIO 201 Human Anatomy and Physiology I and Lab (4 units);
PSIO 202 Human Anatomy and Physiology II and Lab (4 units);

PSYC 101 Introduction to Psychology (3 units)
SOC 101: Introduction to Sociology (3 units)

MED 101 Introduction to Medical Care (2 units)
FCM 201 Being a Healthcare Professional (3 units)
FCM 296 Seminar- Careers in Medical-Health Sciences (2 unit)
CMM 459 \& 461 Clinical Reasoning and Medical Case Based Learning (2 units)
CMM 410 Human Histology: An Intro to Pathology (3 units) OR equivalent Histology, CMM 43 PSIO 467 Endocrine Physiology (3 units)
IMB 401 Medical Microbiology \& Immunology (4 units), OR PSIO 431 Physiology of the Imm MED 441 Introduction to Medical Devices and Their Utilization (3 units)
MED 401 Medical Ethics and Professionalism (3 units), OR PSIO 411 Scientific Methods and PHCL 412 Intro to Pharmacology (3 units), OR PCOL 406 Comprehensive Human Pharmacolc PATH 415 Mechanisms of Human Diseases (3 units)
FCM 496D Disability Perspectives in Research, Policy, and Practice (3 units)


Professional Ethics, OR MED/PHIL 321 Medical Ethics (3 units)

## 发 The University of Arizona。

## NEW ACADEMIC PROGRAM-UNDERGRADUATE MAJOR ADDITIONAL INFORMATION FORM

I. MAJOR DESCRIPTION -provide a marketing/promotional description for the proposed program. Include the purpose, nature, and highlights of the curriculum, faculty expertise, emphases (sub-plans; if any), etc. The description will be displayed on the advisement report(s), Degree Search, and should match departmental and college websites, handouts, promotional materials, etc.

Bachelor of Science in Medicineine (CIP CODE - 51.119951.0000, College of Medicine) The Bachelor of Science in Medicine is a four-year degree program designed and delivered as a collaboration between clinicians, basic scientists and humanists, with focus on clinical reasoning and case-based learning. The program juxtaposes applied topics such as what it is to be a health care provider, clinical case analysis, medical ethics, professionalism, health care delivery to improve quality care, and hands-on experience through simulation, with topics in the human medical sciences, including advanced anatomical, biochemical, neurological, and physiological science, pathology of disease, mechanisms of treatment, and integrative therapies. This degree does not allow licensure to practice medicine.

Understanding and integrating medical technology in healthcare practice is critical in the future of health care and is included in the degree program as an area of emphasis. The degree is designed to provide students with opportunities to learn about the application of personal medical devices in cutting-edge medical/healthcare research as well as educate students on the effective use of medical devices and biomedical data to evaluate disease presentations and/or disease risk factors and help understand therapy options.

The BS in Medicine is a multi-disciplinary degree program involving collaboration with UArizona programs in Engineering, Life Sciences, Applied Sciences and Technology, Social and Behavioral Sciences, Humanities, Nutritional Sciences, Nursing, Pharmacy and Public Health. The program provides a broad range of electives for in-depth study, including in biomedical engineering, bioinformatics, emergency medicine, aging in medicine, medical ethics, integrative medicine, history of medicine, and climate change as a factor in medical care.

Faculty involved in design and oversight of the program are clinicians and basic scientists who contribute significantly to professional health science programs at UArizona, especially Medicine. This faculty expertise insures that the BS in Medicine is and will remain carefully tailored to meet the needs of students seeking entry into professional healthcare programs and/or careers in allied health. Guided by the aforementioned faculty, students in the BS in Medicine program will develop knowledge and clinical reasoning skills useful in understanding their own health as well as in counseling and caring for others. Students will learn the use of
technological devices and virtual/telemedicine as healthcare tools as well as the medical content knowledge, and the hands-on skills using simulation and shadowing to prepare for the many and diverse health care jobs/careers available.

The purpose of the program is to advance student knowledge of human diseases/disorders, treatments, patient-professional interactions, clinical reasoning, medical health technology and cutting-edge research in medicine/health care. Students who graduate from the program will be well-prepared to: 1) enter careers directly in health care support positions; or 2) enter advanced degree programs in Human Medical and Health Sciences (i.e., medicine, nursing, nurse anesthetist, physical/occupational therapy, pharmacy, public health, physician assistant, clinical research, basic science research/tech, hospital lab tech, industry, etc.); or 3) become familiar with the basic science of human medicine as supportive to alternative careers (i.e., medical marketing, medical technology, medical law, biomedical engineering, medical business, medical administration, etc.). Yet, completion of this degree does not include licensure to practice medicine.
II. NEED FOR THE MAJOR/JUSTIFICATION-describe how the major fulfills the needs of the city, state, region, and nation. Provide market analysis data or other tangible evidence of the need for and interest in the proposed major (and emphases, if applicable). This might include results from surveys of current students, alumni, and/or employers or reference to student enrollments in similar programs in the state or region. Include an assessment of the employment opportunities for graduates of the program for the next three years. Curricular Affairs can provide a job posting/demand report by skills obtained/outcomes/CIP code of the proposed major. Please contact the Office of Curricular Affairs to request the report for your proposal.

## United States,

Healthcare consumes nearly one-fifth of the US economy with projections of job growth at >30\% for the next 10 to 20 years $^{1}$. A powerful signal of rising demand for healthcare services and healthcare workers is how much money is projected to be spent on healthcare in the future. From 2010 to 2026 the amount spent on healthcare is projected to double reaching beyond $\$ 5.7$ trillion ${ }^{1}$. Expenditures include payments for all healthcare costs, including pharmaceuticals, equipment and technology.
Expenditures will rise for many reasons, but growing demand for the services of healthcare


Employment growth in the healthcare sector has been expanding since the end of the recession and continues to expand month over month according to the US Bureau of Labor Statistics Current Employment Statistics ${ }^{1,2}$. Reports indicate healthcare job growth has been robust and graduates of our rigorous and relevant program will be in high demand, representing a specific and desired talent in the medical health care sector ${ }^{2}$

The need for well-trained healthcare professionals no doubt corresponds with larger demographic and population trends. Specifically, the aging of the US population will place greater
 demands on healthcare systems and services. By 2030 there will be 72 million elderly in the US, about $19 \%$ of the population ${ }^{1,2}$.

## State of AZ:

The state of Arizona is not insulated from the aforementioned trends and specific needs must be met in order to train, retain and grow the healthcare workforce within the state. Strategies to meet the growing demands include: increasing the number of health professions students and trainees that practice in Arizona after graduation through scholarships, loan repayment, tuition remission and tax credits; recruiting licensed health professionals from other states and countries; enhancing the efficiency of care delivery through integration and inter- professional team based care; retaining the existing

GAP GROWS BETWEEN HEALTHCARE JOB OPENINGS \& HIRES
source: Burea of sober Statistics
 workforce - through retention incentives ${ }^{3,4,5}$.

## Alignment with UArizona Strategic Plan

The BS in Medicine aligns with the University of Arizona strategic plan, specifically, Pillar II: Grand Challenges and aims to leverage 4th Industrial Revolution advancements and tackle critical problems at the edge of human endeavor. Students who complete this degree program can go on to confront pressing health and wellness challenges in our communities through interdisciplinary collaboration. Students will be prepared to bring wellbeing and the use of medical device technology to communities, improving health and quality of life. This degree has
a strong focus on what it takes to become a health care provider, how to use medical information to create pathways
for future medical care, medical science-
based reasoning, healthcare management, medical technology, medical devices, medical supplies manufacturing, machine learning, medical/health informatics and environmental influences on health and medical care. Students educated in use of medical devices and the science of "biomedical data" will be in high demand and can help to build a workforce capable of addressing grand challenges related to

AVERAGE ANNUAL JOB OPENINGS 2016-2026 source: Bureau of Labor Statistics

disease prevention and wellness.
A BS in Medicine will allow students to directly enter into the workforce including:
Healtheare Providers at nursing homes (33\% projected growth by 2026),
Home Health Aides (70\% projected growth by 2026);
Personal Care Aides (32\% projected growth by 2026);
Physical Therapist Aides (32\% projected growth by 2026);
Occupational Therapy Assistants ( $22 \%$ projected growth by 2026);
Phlebotomists (20\% projected growth by 2026); Health Care in Artificial Intelligence (1,858 jobs posted in Indeed.com)
Worldwide Healthcare Business Development, Salary 122,300/year, Experience in the Healthcare Industry, good understanding of how the healthcare industry (both provider and payer) operates and the unique characteristics of the industry ecosystem. Advanced research experience and understanding of clinical genomics is a plus. Education in health/medical sciences preferred)
Health Care Sales Rep, 1+years of experience selling technology to Healthcare customers - BA/BS degree or equivalent work experience required)
Health Administration-Health Care Management; (BA/BS degree required)
Director of Global Clinical Intelligence ( $B A / B S$ degree required)
Health Research and Development Contractor (BA/BS degree required)
Health Information Technologist; $(B A / B S$ degree required for some positions + Experience required for some positions)(salary ranges from \$55,260-\$109,000) (Projected 10-year growth: 13\%)

- Systems analyst
- Consultant
- Product architect
- Programmer analyst
- Software developer
- Software engineer
- Chief security officer
- Chief technology officer

Medical Technologist; Projected 10-year growth: $23 \%$ (BA/BS degree required) Salary \$76,000-86,000/year
Medical Research Analyst (BA/BS degree required)(salary varies based on experience -4 levels are available)

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Commented [MOU1]: to be removed since the criticism is that these can be achieved out of high school, low paying and in some cases only need a certificate. Not a BS degree
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## Medical Marketing Specialist (BA/BS degree or equivalent work experience required) <br> Medical Program Coordinator (BA/BS degree or equivalent work experience required) <br> Clinical Study Analyst ,Bachelor's dearee in a health-related field or an equivalent combination of education and experience with preference to an advanced degree)

Tables for income based on the US Bureau of Labor Statistics
(https://www.bls.gov/ncs/ocs/sp/nctb0750.pdf)

## A BS in Medicine along with advanced certification and/or a Master's degree will allow students to enter the following careers:

Physician Assistants ( $3140 \%$ projected growth by 203026)(Median pay $\$ 112,260$ annual);
Licensed Practical and Vocational Nurses (LPN \& LVN) (37\% projected growth by 2026);
Physical Therapist Assistants ( $430 \%$ projected growth by 2026)(Median pay \$52,000 annual); Medical Assistant s(28\% projected growth by 2026);
Operations Research Analysts (25\% projected growth by 2026);
Health Specialties Teachers-Postsecondary (22\% projected growth by 2026);
Occupational Therapists (25\% projected growth by 2026);
Perfusionist and Echo Technician;
Radiation Therapist/Technologist;
Radiologic and MRI Technologists;
Medical Device Technologist;
Pharmacy Technician Certificate;
Surgical Technologists;
Massage Therapists;
Medical Records and Health Information Technicians;
Dental Assistant;
Nuclear Medicine Technologist;
Dental Hygienists;
Diagnostics Medical Sonographers and Cardiovascular Technologists and Technicians;
Medical and Clinical Laboratory Technologists and Technicians;
Speech Therapy
Respiratory Therapy
Emergency Medical Training
Paramedics

## A BS in Medicine along with advanced doctoral degree and licensure will allow students to enter into careers such as:

Physical Therapists (DPT); (18\% projected growth by 2030)-(Median pay \$89,440 annual);

Medical Physician (MD or DO),
Professor (PhD),
Pharmacists (PharmD),

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Dentist (DDS),
Podiatrist (DPM),
Optometrist (OD),
Nurse Practitioners (RN) (41\% projected growth by 2026) and (DNP)
Nurse Anesthetists,
Nurse Midwives,

## By partnering with other Colleges, BS in med opens up opportunities in careers like:

Environmental Law and Policy.
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Public Administration.
Clinical Research.
Nonprofit Leader
Global Health Non-Profit Leader
Medical/Health Care and Business
Medical/Health Care and Cyber Security
The College of Medicine will be creating a unique "admittance to medical school from high school" for select students to encourage top high school performers in the State of AZ as well as Students with a diverse background to attend the UofA COM. The College of Medicine has created a unique "Accelerated Pathway to Medical Education, APME" which is a 7 year program for select high school students nationwide.
https://medicine.arizona.edu/admissions/accelerated-pathway-medical-education-apme The BS in Medicine is one program that would be available for students.

References:

1. Future of Healthcare Jobs. Healthcare News. AMN Healthcare. Retrieved from:
2. Current Employment Statistics (CES) National. United States Bureau of Labor Statistics. Retrieved from bls.gov/ces.
3. Tabor JA, Jennings N, Kohler L, Degan B, Derksen D, Campos-Outcalt D, Eng HJ. The Supply of Physician Assistants, Nurse Practitioners, and Certified Nurse Midwives in Arizona: Arizona Area Health Education Centers and Center for Rural Health, University of Arizona, Tucson, 2014;138; . ;
4. Tabor JA, Eng HJ. Arizona Rural Health Workforce Trend Analysis 2007-2010. Tucson: Arizona Area Health Education Centers and Center for Rural Health, the University of Arizona, 2012;
http://crh.arizona.edu/sites/crh.arizona.edu/files/u25/AZ Workforce Trend Analysis_2007-10 0.pdf.
5. Tabor JA, Jennings N, Kohler L, Degan B, Derksen D, Campos-Outcalt D, Eng HJ. Safety Net Health Care in Arizona 2015. Tucson (AZ): Arizona Area Health Education Centers and Center for Rural Health, University of Arizona, Tucson, 2016; 36.
III. MAJOR REQUIREMENTS- complete the table below by listing the major requirements, including required number of units, required core, electives, and any special requirements, including emphases* (sub-plans), thesis, internships, etc. Note: information in this section must be consistent throughout the proposal documents (comparison charts, four year plan, curricular/assessment map, etc.). Delete the EXAMPLE column before submitting/uploading. Complete the table in Appendix A if requesting a corresponding minor.

| Total units required to complete the <br> degree | $12 \underline{0} 0$ |
| :--- | :--- |


| Upper-division units required to complete the degree | 42 |
| :---: | :---: |
| Foundation courses |  |
| Second language | Second Semester Proficiency, |
| Math | Moderate Math Strand |
| English | (3-6 units) <br> ENGL 101 or 107 (3) <br> ENGL 102 or 108 (3) <br> or <br> ENGL 109H (3) |
| General education requirements | ```General Education: (21 units) 2 courses/ 6 units- Tier I 150 (INDV) 2 courses/ 6 units-Tier I 160 (TRAD) 1 course/ 3 units-Tier II Arts 1 course/ 3 units-Tier II Humanities 1 course/ 3 units-Tier II Individuals and Societies``` <br> NOTE Students pursuing the MCAT will be informed in taking Psychology and Sociology course work and a degree road map will be provided |
| Pre-major? (Yes/No).Ifyes, provide requirements. Provide email(s)/letter(s) of support from home department head(s) for courses not-owned by your department. | No |
| List any special requirements to declare or gain admission to this major (completion of specific coursework, minimum GPA, interview, application, etc.) | None |
| Major requirements |  |
| Minimum \# of units required in the major (units counting towards major units and major GPA) | 9352 |
| Minimum \# of upper-division units required in the major (upper division units counting towards major GPA) | $4 \underline{0} 7$ (300 \& 400 level courses) |
| Minimum \# of residency units to be completed in the major | 1818 |
| Required supporting coursework (courses that do not count towards major units and major GPA, but are required for the major). Courses listed must include prefix, number, units, and title. Include any limits/restrictions needed (house number limit, etc.). Provide email(s)/letter(s) of support from home department head(s) for courses not owned by your department. | Statistics Requirement (3 units) <br> Choose one: <br> MATH 163 Basic Statistics (3 units) <br> MATH 263 Introduction to Statistics and Biostatistics (3 units) <br> SBS 200 Introduction to Statistics for the Social Sciences (4 units) <br> BME 376: Biomedical Statistics (3 units) <br> AREC 239 Introduction to Statistics and Data Analysis (4 units) <br> General Sciences: (3390 units) <br> CHEM 141 and 143/145 or CHEM 151 or General Chemistry I (4 units); |

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recommended for the MCAT

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|  | CHEM 142 and 144/146 or CHEM 152 or General Chemistry II (4 units); <br> PHYS 102/198 or PHYS 141/142 Physics I and Lab (4 units); <br> PHYS 241/242 Physics II and Lab (4 units); <br> CHEM 241A and 243A Organic Chemistry I and Lab (4 units); <br> BIOC 384 Foundations in Biochem OR <br> BIOC 385 Metabolic Biochemistry (3 units); <br> MCB 181R \& L Introduction to Biology \& Lab/ ECOL 181R \& L (43 units) <br> ECOL 182 Introductory Biology II (4 units) <br> PSIO 201 Human Anatomy and Physiology I and Lab (4 units); <br> PSIO 202 Human Anatomy and Physiology II and Lab (4 units); |
| :---: | :---: |
| Major requirements. List all major requirements including core and electives. If applicable, list the emphasis requirements for each proposed emphasis*. Courses listed count towards major units and major GPA. Courses listed must include prefix, number, units, and title. Mark new coursework (New). Include any limits/restrictions needed (house number limit, etc.). Provide email(s)/letter(s) of support from home department head(s) for courses not owned by your department. | Major Core: (3333 units) <br> MED 101 Introduction to Medical Care (2 units) <br> FCM 201 Being a Healthcare Professional (3 units) <br> FCM 296 Seminar- Careers in Medical-Health Sciences (2 unit) <br> CMM 459 \& 461 Clinical Reasoning and Medical Case Based Learning <br> (2 units) <br> CMM 410 Human Histology: An Intro to Pathology (3 units) <br> OR equivalent Histology, CMM 437, and 438 and 439 (1 unit each) <br> PSIO 467 Endocrine Physiology (3 units) <br> IMB 401 Medical Microbiology \& Immunology (4 units) <br> OR PSIO 431 Physiology of the Immune System (3 units) <br> MED 441 Introduction to Medical Devices and Their Utilization (3 <br> units) <br> MED 401 Medical Ethics and Professionalism (3 units) <br> OR PSIO 411 Scientific Methods and Professional Ethics <br> OR MED/PHIL 321 Medical Ethics (3 units) <br> PHCL 412 Intro to Pharmacology (3 units) <br> OR PCOL 406 Comprehensive Human Pharmacology (5 units) <br> PATH 415 Mechanisms of Human Diseases (3 units) <br> FCM 496D Disability Perspectives in Research, Policy, and Practice (3 units) <br> Major Elective Areas: (189 units)- Emphases intended to assist in advising students <br> Emphases 1- Medical Technology; <br> BME 477 Introduction to Bioinformatics (instru consent rqd) (3 units) <br> BME 486 Biomaterial-Tissue Interactions <br> PHCL 386 Intro to Tech Transfer in Medicine (3 units) <br> CSC 250 Essential Computing for the Sciences <br> CMM 441: Brightfield Microscopy (1 unit) <br> CMM 446: Fluorescence Microscopy (1 unit) <br> CMM 442: Fundamentals of Digital Imaging (1 unit) <br> LAW 476A - Drug Discovery, Development, and Innovation to Reach the Marketplace (3 units) <br> BME 4** Technology and Big Data in Individualized Care (3 units) <br> SURG 401 Virtual Medical Care Training \& Education in the Digital Age (2 units) <br> FCM 4** Clinical Application of Medical Technology (3 units) <br> Emphases 2- Basic Medical Sciences; |


PSYC 101 Intro to Psychology (3 units) recommended for MCAT
CHEM 241B and 243B Organic Chemistry I and Lab (4 units)
recommended for some Medical Schools
CMM 401 Gross Anatomy (Summer course only) (4 units)
CMM 437 Immunology Basics (1 unit)
IMB 467 Cancer Immunology and Immunotherapy (3 units)
IMB 465 Principles and Molecular Mechanisms of Microbe-Host
Interactions (3 units)
CMM 427 Pathophysiology Basics (1 unit)
解 428 Pathophysiology of Integumentary, Respiratory \& Digestive
Systems (1 unit)
CMM 429 Pathophysiology of Urogenital and Endocrine Systems (1
unit)
CMM 404 Cell Biology of Disease (3 units)
PHCL 445 Drugs of Abuse (3 units)
PHCL 430 Pain (2 units)
PHCL 444 Human Neurobiology Basics (1 unit)
PHCL 331 Controversies in Pharmacology (3 units)
PSIO 427 Metabolism and Disease ( 3 units)
PSIO 450 Respiratory Physiology (3 units)
PSIO 452 Digestive Physiology (3 units)
PSIO 465 Systems Neurophysiology (3 units)
PSIO 469 Human Reproductive Physiology (3 units)
PSIO 485 Cardiovascular Physiology (3 units)
PSIO 487 Physiology of Aging (3 units)
PHCL 442 Human Performance Pharmacology (3 units)
PCOL 410 Pharmacogenomics and Precision Medicine (3 units)
PCOL 305 Drug Approval: The 3 Billion Dollar Bet (2 units)
PCOL 355 Drug Delivery Systems (3 units)
PCOL 350 ADME: How the Body Changes Drugs (3 units)
CMM 444-6: Medical Embryology (1-3 units)
New IMB 402 Medical Microbiology Basics (1 unit)
New IMB 404 Medical Virology Basics (1 unit)
MCB 301 Molecular Basis of Life (4 units)
MCB 304 Molecular Genetics (4 units)
Emphases 3-Medicine and Society;
PHPM 310 Health Care in the U.S. (3 units)
LAW 452 Health Law (3 units)
LAW 478A - Legal and Regulatory Aspects of Healthcare Delivery (3
units)
LAW 480A - Liability and Regulation of Healthcare Professionals (3
units)
EHS 425-A Public Health Lens to Climate Change (3 units)
FCM 496E Introduction to Population Health Management (3 units)
PHPM 310 Health Care in the US" (3 units)
FCM 302 Clinical Health Disparities in Sexual and Gender Minority
(SGM) Populations (3 units)
Clinical-Community Collaboration (3 units)
MED 218 The History of Medicine (3 units)

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|  | HIST 373 Politics of Health and Medicine in the Americas: From Historical Roots to Contemporary Development (3 units) <br> MED 319 The History of Medical Technology (2 units) <br> MED 3** Parallel History of Medicine and Law (3 units) <br> CMM 479 Art of Scientific Discovery (1 unit) <br> HPS 433 Global Health (3 units) <br> EHS 439A Outbreaks and Environmental Microbiology: Then to Now (3 units) <br> EHS 420 Environmentally Acquired Illnesses (3 units) <br> HIST 311 History of Epidemics (3 units)- Cross list as MED 311 <br> HNRS 305 Narrative Medicine and Healthcare (3 units) <br> Emphases 4- Integrative and Practice-Focused Medicine <br> FCM 301 Substance Misuse in Maternal and Child Health Populations (3 units) <br> FCM 496A Advancements in Substance Misuse Research and Clinical Care Seminar (2 units) <br> PSIO 497A Physiology of Mind-Body Interactions (3 units) <br> IHM 401/501 Integrated Health \& Medicine Foundation: Mind-Body- <br> Spirit: Addressing Stress \& Mental Health (1 unit) <br> FCM 424/524 Arts and Community Health Intercultural Perspectives and Applications Parts I-III (1-3 units) <br> FCM 303 Difficult Conversations in Patient Care: The Art of Empathy (1 unit) <br> EMD 197 - Emergency Medical Technician (4 units) <br> EMD 350 - Advanced Emergency Medical Services Systems (3 units) <br> NSC 2** Fundamentals of Precision Nutrition and Wellness (3 units) <br> PHP 205 - Fundamentals of Telehealth (3 units) <br> NSC 310 Principles of Human Nutrition in Health and Disease (3 units) AIS/MAS/MED 435 Mexican Traditional Medicine: An Overview of Indigenous Curing Cultures (3 units) <br> MED 301 Healthcare Professional Well-being (1 unit) |
| :---: | :---: |
| Internship, practicum, applied course requirements (Yes/No). If yes, provide description. | Optional working towards required (to be phased in) <br> New MED 4** Clinical Applications of Medical Technology (2 <br> units)(Marv Slepian \& Vignesh Subbian) <br> FCM 498 Community Health Field Training Experience (2 units) <br> New PATH 4** Clinical Skills (path, pharm, phlebotomy, EKG, imaging, <br> etc.) (2 units) (Mark Nelson) <br> New FCM 4** Reflections on Clinical Medicine through Clinical <br> Shadowing (Karyn Kohlman) <br> New FCM/COPH 4** Community Health Field Training Experience <br> (Ben Brady, Bridget Murphy, Ron Sorenson) |
| Senior thesis or senior project required (Yes/No). If yes, provide description. | No |
| Additional requirements (provide description) | No |
| Minor (specify if optional or required) | Optional |
| Any double-dipping restrictions (Yes/No)? If yes, provide description. | Yes, major core courses not permitted to double-dip. Supporting coursework may double dip with other majors |

*Emphases are officially recognized sub-specializations within the discipline. ABOR Policy 2-221 c. Academic Degree Programs Subspecializations requires all undergraduate emphases within a major to share at least 40\% curricular commonality across emphases (known as "major core"). Total units required for each emphasis must be equal. Proposed emphases having similar curriculum with other plans (within department, college, or university) may require completion of an additional comparison chart. Complete the table found in Appendix B to indicate if emphases should be printed on student transcripts and diplomas.
IV. CURRENT COURSES-using the table below, list all existing courses included in the proposed major. You can find information to complete the table using the UA course catalog or Uanalytics (Catalog and Schedule Dashboard "Printable Course Descriptions by Department" On Demand Report; right side of screen). If the courses listed belong to a department that is not a signed party to this implementation request, upload the department head's permission to include the courses in the proposed program and information regarding accessibility to and frequency of offerings for the course(s). Upload letters of support/emails from department heads to the "Letter(s) of Support" field on the Uaccess workflow form. Add rows to the table, as needed.

| Course prefix <br> and number (include crosslistings) | Unit <br> 5 | Title | Course Description | Pre-requisites | Modes of delivery (online, inperson, hybrid) | Typically Offered (F, W, Sp, $\mathrm{Su})$ | Dept signe d party to propo sal? (Yes/ No) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |


| MATH 3 | 3 | Basic Statistics | Organizing data: displaying | PPL 60+ or MCLG | In-person | F, Sp | Y |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 163 |  |  | distributions, measures of center, | $88+$ or SAT I MSS |  |  |  |
| Equivalen |  |  | measures of spread, scatterplots, | $640+\text { or ACT }$ |  |  |  |
| t to: <br> (DATA |  |  | correlation, regression, and their interpretation. Design of | MATH $26+$ or one recent course |  |  |  |
| 361, |  |  | experiments: simple random samples | from MATH 108, |  |  |  |
| DATA |  |  | and their sampling distribution, | $112,113,116$ |  |  |  |
| 363, MATH |  |  | models from probability, normal distributions, and normal | 119A, 122B, or |  |  |  |
| 160, |  |  | approximations. Statistical inference: |  |  |  |  |
| MATH |  |  | confidence intervals and hypothesis |  |  |  |  |
| 160-CC, |  |  | testing, t procedures and chi-square |  |  |  |  |
| $\begin{aligned} & \text { MATH } \\ & \text { 163-CC, } \end{aligned}$ |  |  | tests. Not intended for those who plan further studies in statistics. |  |  |  |  |
| MATH |  |  | Except as per University policy on |  |  |  |  |
| 263, |  |  | repeating a course, credit will not be |  |  |  |  |
| MATH |  |  | given for this course if the student has credit in a higher level math |  |  |  |  |
| MATH |  |  | has credit in a higher level math course. Such students may be |  |  |  |  |
| 361, |  |  | dropped from the course. |  |  |  |  |
| MATH |  |  | Examinations are proctored. |  |  |  |  |
| 363) |  |  |  |  |  |  |  |
| MCB | 3 | Introduct ion to Biology | Introduction to biology covers | PPL 40+ or SAT I | In-person, online | F, Sp, Su |  |
| 181R |  |  | fundamental principles in molecular | MSS 560+ or ACT |  |  |  |
| Equivalen |  |  | and cellular biology and basic | MATH 24+ or one |  |  |  |
| $t$ to: |  |  | genetics. Emphasis is placed on | course from Math |  |  |  |
| (BIOC |  |  | biological function at the molecular | 108, 112, 113, |  |  |  |
| 181R, |  |  | level, with a focus on the structure | 119A, 120R, 124, |  |  |  |
| ECOL |  |  | and regulation of genes, the |  |  |  |  |


| 181R, <br> MCB 184, <br> MCB 315, <br> MIC <br> 181R) |  | structure and synthesis of proteins, how these molecules are integrated into cells, and how these cells are integrated into multicellular systems. Examples stem from current research in bacteria, plants, and animals (including humans) in the areas of cell biology, genetics, molecular medicine and immunology. | $\begin{aligned} & \text { 122B, 125, 129, or } \\ & 223 . \end{aligned}$ |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MATH <br> 263 <br> Equivalen <br> t to: <br> DATA <br> 361, <br> DATA <br> 363, <br> MATH <br> 160, <br> MATH <br> 160-CC, <br> MATH <br> 163, <br> MATH <br> 163-CC, <br> MATH <br> 263- <br> CC, <br> MATH <br> 361, <br> MATH <br> 363 | Introduct ion to Statistics and Biostatist ics | Organizing data; distributions, measures of center and spread, scatterplots, nonlinear models and transformations, correlation, regression. Design of experiments: models from probability, discrete and continuous random variables, normal distributions, sampling distributions, the central limit theorem. Statistical inference; confidence intervals and test of significance, t procedures, inference for count data, two-way tables and chi-square procedures, inference for regression, analysis of variance. Examinations are proctored | PPL 60+ or MCLG $88+$ or SAT I MSS 640+ or ACT MATH 26+ or one recent course from MATH 108, 112, 113, 116, 119A, 122B, or 125 | In-person online (iCourse) | F, Sp, Su | Y |
| CHEM <br> 141 and 143/145 <br> or CHEM <br> 151 | 44 <br> General <br> Chemistr <br> y I | Separate lab and lecture, both offered in-person and online (CHEM 141 and $143 / 145$ ). There is also an in-person only integrated lecture-lab course. Both sequences are designed to develop a basic understanding of the central principles of chemistry | Credit is allowed for only one of these lecture/lab combinations: CHEM 105/106A, CHEM 141/143, CHEM 151 or CHEM 161/163. | In-person, online | F, Sp, Su | Y |
| CHEM <br> 142 and <br> 144/146 <br> or CHEM <br> 152 | 44 General <br> Chemistr <br> y II | Separate lab and lecture, both offered in-person and online (CHEM 142 and $144 / 146$ ). There is also an in-person only integrated lecture-lab course. Both sequences are continuations and designed to develop a basic understanding of the central principles of chemistry. | Credit allowed for only one of the these lecture/lab combinations: CHEM 105B/106B, CHEM 142/144, CHEM 162/164, or CHEM 152. | In-person, online | F, Sp, Su | Y |
| $\begin{aligned} & \hline \text { PHYS } \\ & 102 / 198 \\ & \text { or } \end{aligned}$ | $4 \quad$ Physics I | Introductory Physics. Topics include motion of particles in one and two dimensions, forces, Newton's laws, energy, momentum, angular | PHYS 102: PPL 60+ or SAT I MSS 610+ or ACT MATH 26+ or one course | PHYS 102: In-person, online | PHYS 102 <br> \& PHYS <br> 181: In- |  |


| $\begin{array}{\|l\|} \hline \text { PHYS } \\ 141 / 142 \end{array}$ |  |  | momentum, and conservation laws, gravitation, fluids: Archimedes and Bernoulli, mechanical waves, sound, temperature, heat, heat engines, laws of thermodynamics. OR A first course in Newtonian mechanics; introduces freshman-level students to the statics and dynamics of point particles, rigid bodies, and fluids. Topics include vector algebra, projectile and circular motion, Newton's Laws, conservation of energy, collisions and conservation of momentum, rotational dynamics and conservation of angular momentum, statics, harmonic oscillators and pendulums, gravitation and Kepler's Laws, fluid statics and dynamics. | from MATH 108, 112, 113, 116, 119A, 120R, 122B, 125, 129, or 223 PHYS 141: MATH 122B, 124, or 125, or appropriate Math Placement Level | PHYS 141: In-person | person: <br> F, Sp, Su <br> PHYS 102 <br> Online: F <br> PHYS <br> 141: F, <br> Sp, Su |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| AREC 239 | 4 | Introduct ion to Statistics and Data Analysis | This is an introductory course in statistics and probability. This course deals with applied data analysis, probability concepts, and statistical inference including confidence intervals and hypothesis testing. Applications and examples will be drawn from life and social sciences. | PPL 60+ or MCLG $88+$ or SAT I MSS 640+ or ACT MATH 26+ or one recent course from MATH 112, $113,116,122 \mathrm{~B}$, or 125 | In-person | Sp |  |
| $\begin{aligned} & \text { CHEM } \\ & 241 \mathrm{~A} \\ & \text { and } \\ & \text { CHEM } \\ & 243 \mathrm{~A} \end{aligned}$ | 4 | Organic Chemistr yI and Lab | General principles of organic chemistry. | CHEM 105B/106B or CHEM 142/144 or CHEM 152 or CHEM 162/164, completion Concurrent registration encouraged. | In-person | F, Sp, Su | Y |
| BME 376: | 3 | Biomedic al Statistics | This course covers application of statistics to biomedical engineering and research. Topics include describing and summarizing biomedical data, study designs, probability distributions, diagnostic testing, and statistical inference for biomedical applications. All topics will involve use of R Statistical Computing Software | MATH 129 and Advanced standing | In-person | F | Y |
| BIOC 384 | 3 | Foundati ons in Biochemi stry | Structure and function of proteins, lipids, carbohydrates, and nucleic acids, with a focus on understanding the molecular function of essential biomolecules | MCB 181R and (CHEM 142 or CHEM 152 or CHEM 105B or CHEM 162) and (CHEM 241A or | In-person, online | $\begin{aligned} & \text { F, W, Sp, } \\ & \text { Su } \end{aligned}$ | Y |


|  |  |  |  | CHEM 242A or CHEM 246A) |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| BIOC 385 | 3 | Metaboli c <br> Biochemi stry | Fundamentals of metabolism and nucleic acid biochemistry at the cellular and organismal levels, with a focus on key pathways and regulatory mechanisms | MCB 181R and (CHEM 142 or CHEM 152 or CHEM 105B or CHEM 162) and (CHEM 241A or CHEM 242A or CHEM 246A). | In-person, online | $\begin{aligned} & \text { F, W, Sp, } \\ & \text { Su } \end{aligned}$ |  |
| PSIO 201 | 4 | Human <br> Anatomy and Physiolog y I and Lab | Study of structure and function of the human body. Topics include basic anatomical and directional terminology; fundamental concepts and principles of cell physiology; histology; the integumentary, skeletal, muscular and nervous systems; special senses. Primarily for majors in physiology, biology, and health professions. |  | In-person | F, Sp, Su | Y |
| PSIO 202 | 4 | Human <br> Anatomy and Physiolog y II and Lab | Study of structure and function of the human body. Topics include basic anatomical and directional terminology; fundamental concepts and principles of cell physiology; histology; the integumentary, skeletal, muscular and nervous systems; special senses. Primarily for majors in physiology, biology, and health professions. | PSIO 201 | In-person | F, Sp, SU |  |
| CMM 4103 |  | Human <br> Histology <br> : An Intro <br> to <br> Patholog <br> y | This course will provide pre-health science professions students (Medicine, Pharmacy, Nursing, Public Health) as well as students planning a career in biomedical research with essential background in functional morphology of human tissues and organs. Pathology examples will be used to help illuminate normal structure and function. The mode of instruction will be interactive lecture, including facilitated group study of virtual slides. | MCB 181 or equivalent or permission of instructor. | In-person | Su |  |
| PSIO 4313 | 3 | Physiolog $y$ of the Immune System | Focuses on physiology of the immune system, how it functions correctly, and some problems that occur when the immune system does not function properly (immunopathology). | $\begin{aligned} & \text { PSIO } 201 \text { and PSIO } \\ & 202 \\ & \text { Grade C or better } \\ & \text { s required } \end{aligned}$ | In-person, Online in summer | Sp, Su |  |
| IMB 401 | 4 | Medical <br>  | The molecular and biological characteristics of microorganisms of importance in human health and | Students should have taken undergraduate | In-person, online (iCourse) | Sp | Y |


|  |  | Immunol | disease; the reaction of the host (immune system) to infectious agents and the mechanisms of host defense (immunity); molecular and cellular immunology and pathogenesis of infectious disease. This course will include areas such as immunology, virology, bacteriology, mycology, parasitology and infectious diseases. | courses such as microbiology, immunology, biochemistry, molecular biology or biology to enroll in this course. |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| PSIO 411 | 3 | Scientific <br> Methods and <br> Professio nal Ethics | This course will introduce students to the historical development of scientific scholarship and current controversies within the scientific community; various approaches to scientific methods and the application of these approaches to the natural sciences; elementary background knowledge of experimental design and the statistical procedures commonly used in physiological research; and important procedural, practical, and ethical issues pertaining to physiological research at a modern research university. The course will also provide practical personal experience in selected areas of professional analysis and communication | PSIO 201 and PSIOI <br> 202 <br> Grade C or better required | In-person | F, Sp | Y |
| $\begin{aligned} & \text { MED/PHI } \\ & \text { L } 321 \end{aligned}$ |  | Medical Ethics | Ethical issues that arise in relation to medicine and health care: abortion, euthanasia, the allocation of scarce medical resources, socialized medicine, doctor-patient confidentiality, paternalism, etc. | 2 courses from Tier <br> One - <br> Traditions/Culture s | In-person, online | $\begin{aligned} & \text { F, W, Sp, } \\ & \text { Su } \end{aligned}$ |  |
| PHCL 412 | 3 | Intro to Pharmac ology | Principles of how drugs act to produce changes within the body. Lectures will include the anatomy of physiology of body structures, with special emphasis on the processes that govern drug absorption, distribution, metabolism, and excretion. Other lectures will include the processes that establish and maintain intracellular electrical charge the membrane potential, nerve impulse conduction, how excitable tissue becomes excited or inhibited, and the mechanism(s) of drug action on such tissues. | 1 course in Biochemistry | In-person, online | F | Y |


| FCM 201 | 3 | Being a Healthcar e Professio nal | Course offers an overview of our health care system in the larger context of our society. It includes the history of different health care fields, communication with patients, health disparities, discussion of health systems and policy issues, and interprofessional and cross-cultural care. | Two courses from Tier One, Individuals \& Societies | Online , inperson | Sp | Y |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { FCM } \\ & 496 \mathrm{D} \end{aligned}$ | 3 | Disability <br> Perspecti <br> ves in Research, Policy, and Practice | This course will provide an introduction to how the lives of people with disabilities are framed by society through research, policy, and practice. Interdisciplinary in focus, the course will explore: 1) disability as conceptualized by society historically and in theory, policy and practice today; 2) the lived experience - disability over the lifespan; and 3) how research and policies inform practices in the field. Students will bring perspectives from their respective fields of study. | $\begin{aligned} & \text { PSIO 201/202 } \\ & \text { highly } \\ & \text { reccomended } \end{aligned}$ | Online, inperson | F | Y |
| PATH 415 | 3 | General Patholog y | The course will deal with the basic reactions of cells and tissues to injury that underlie all disease processes and include cell injury and death, circulatory disturbances, inflammation and repair and disturbances of growth and neoplasia. concepts will be introduced in problem-based studies including 1) Definition of the process; <br> 2) Pathogenesis and patho-genetic mechanisms important in the development of the process; 3) Morphologic characteristics that are useful for recognition of the process; <br> 4) Clinical and pathophysiologic significance of the process; and 5) Physiologic and pathologic sequelae of the process. | Biology or Physiology (4 units) and Chemistry 4 units | On-line and in person | F | Y |
| BME 477 | 3 | Introduct ion to Biomedic al Informati cs | Topics at the intersection of people, health information and technology. | $\begin{aligned} & \text { ECE } 175 \text { or CSC } \\ & \text { 127A or CSC } 110 \end{aligned}$ | On-line and in person | F | Y |
| BME 486 | 3 | Biomater ial-Tissue Interactio ns | Biomaterials and their applications; protein-surface and bloodbiomaterial interactions, inflammation, wound healing, | CHEM 151, or CHEM 103A, or CHEM 103A-CC, or CHEM 104A, or | On-line and in person | S | Y |


|  |  |  | biocompatibility, implants and tissue engineering. | CHEM 105A, or CHEM 106A, |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CSC 2504 | 4 | Essential <br> Computi <br> ng for the Sciences | This course teaches essential computing skills for students in scientific disciplines. No prior background in programming is required. The content focuses on three computational skills: (i) basic programming in a scripting language such as Python, and knowledge of its supported data structures; (ii) facility with the UNIX operating system environment, including file structure, regular expressions, and job control; (iii) essential database skills, including database accession and interfacing through the SQL query language. | none | On-line | F, Sp |  |
| CMM 441 1 |  | Bright- <br> Field <br> Microsco <br> py | This course will cover the fundamentals and theory of BrightField Microscopy. Students will learn image formation theory based on optical theory and diffraction as it relates to bright-field methods. The class will discuss several modes of bright-field microscopy, including standard bright-field, phase contrast, polarized light, and differential interference contrast microscopy. | MCB 181R | On-line | Sp | Y |
| CMM 4461 | 1 | Fluoresce nce Microsco py | This course will cover the fundamentals and theory of Fluorescence Microscopy. Students will learn image formation theory based on optical theory and light interactions. The class will discuss several modes of fluorescence microscopy, including: Wide-field fluorescence, Confocal microscopy, Convolution and deconvolution, Super-Resolution imaging. The content will conclude with a discussion of Imaging Ethics, as relates to fluorescence microscopy and as accepted by the world's scientific community. | MCB 181R | On-line | Sp | Y |
| CMM 442 1 | 1 | Fundame ntals of Digital Imaging | This course will cover the fundamentals and theory of Digital Imaging. Students will learn image resolution theory based on optical theory. Once the fundamentals have been covered, the class will discuss several aspects of Digital Imaging. | MCB 181R | On-line | Sp | Y |


|  |  |  | The content will conclude with a discussion of Imaging Ethics, as relates specifically to digital imaging and as accepted by the world's scientific community. Digital imaging is a ubiquitous tool in biomedical research and in medical practice, therefore, students pursuing many fields in medicine will benefit from an understanding of this very versatile tool. |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| BIOC 466 4 | 4 | Biochemi <br> stry of <br> Nucleic <br> Acids | The biochemistry of nucleic acids Including replication, repair, recombination, restriction of DNA, transcription, processing and translation of RNA, gene regulation and biochemical and genomic techniques to study these processes with a molecular emphasis. Designed primarily for majors and minors in biochemistry and chemistry. | BIOC462A | In-person, online | Sp | Y |
| CMM 4104 |  | Human Gross Anatomy | This course is an intensive, dissection-based survey of the gross structure of the human body. The course is intended for upper-level undergraduates (and graduate students, who will take the 501 version of the course) preparing for careers in biomedical sciences, biology teaching or anthropology. Daily labs will be student-directed opportunities for active learning and peer teaching. Exams will be both practical and written. | $\begin{array}{\|l\|} \hline \text { PSIO 201, } \\ \text { PSIO } 202 \end{array}$ | In-Person | Su | Y |
| CMM 4371 |  | Immunol ogy <br> Basics | The immune system integrates with all organ systems of the body, providing defense against pathogenic microorganisms and cancer, while contributing to homeostasis of many pathways throughout the body. This course, intended as an introduction to immunology, will provide essential background for medical and other health sciences students studying the immune system. | MCB 181R | On-Line | Sp | Y |
| IMB 465 | 3 | Principles and Molecula r Mechanis ms of | Course covers the interactions that occur between microbes (bacteria, parasites and viruses) and their host that result in disease, commensalism or parasitism. Examples will be drawn from systems that have been | MCB 181R | On-Line, Inperson | Sp | Y |



|  |  |  | course is designed to compliment CMM 549, Histology of Urogenital and Endocrine Systems. |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CMM 404 |  | Cell <br> Biology <br> of <br> Disease | This team-taught course is designed to provide a solid introduction to graduate-level cell biology with an emphasis on how key pathways contribute to human disease. The course format consists of discussionoriented lectures on key concepts in cell biology, with each concept linked to specific diseases caused by dysregulation of the relevant pathways. Course topics will be divided into broad cell biology themes with related diseases as "case studies" to illustrate the connection between cell biology and health. | biochemistry, molecular biology, p and cell biology | On-Line, Inperson | Su | Y |
| PHCL 445 | 3 | Drugs of Abuse | Pharmacology and toxicology of abused drugs with emphasis on mechanisms of drug action, theories of addiction, and treatment approaches. | biochemistry, molecular biology, | On-Line, Inperson | Sp | Y |
| PHCL |  | Pain, Neuroph armacolo gy | Students will be introduced to the basic concepts of pain, neural pathways of touch/pain, and neuropharmacology. Students will be required to read research articles and describe the goal of the experiments and well as the techniques used in the manuscripts. Students will be exposed to current research occurring within the department. Students should interact by asking questions and answering questions during lectures. Concepts will include our current understanding of pain perception, pain pathways, and how pain may be perceived at higher cortical levels of the central nervous system (CNS). Students will be introduced to different categories of pain and medications currently used to inhibit pain. | biochemistry, PSIO 201 <br> PSIO 202 | On-Line, Inperson | F | Y |
| PHCL 442 | 3 | Human Performa nce Pharmac ology | In this course, students can explore the pharmacology of purported performance enhancing drugs and supplements used by athletes and "weekend warriors". Lectures and course material will enable students | 4 Units Physiology OR 4 Units Biology) and 4 Units Chemistry. | On-line, in person | F. Sp | Y |


|  |  |  | to review the most discussed and relevant products as well as dismantle public misperception about the actual efficacy and risks associated with these products. |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| PHCL 444 | 1 | Human <br> Neurobio <br> logy <br> Basics | This course will cover the general anatomy and physiology of the human nervous system as well as some pathology and pharmacology. | $\begin{aligned} & \text { PSIO } 201 \\ & \text { PSIO } 202 \end{aligned}$ | On-line | F | Y |
| PHCL 331 | 3 | Controve rsies in Pharmac ology | This writing-intensive course offers students information about prominent and controversial topics in pharmacology. Ideas presented in this course may be new to students or they may represent a novel way of thinking about a topic. Narrated lecture presentations, videos, podcasts, news stories, and manuscripts will allow students to learn the science underlying such controversial events while encouraging an intellectual, ethicsbased exploration of these concepts. Topics include, but are not limited to, lethal injection as capital punishment, health care provider conscience clauses to deny patient medications and services, human performance enhancement drugs, and FDA compassionate drug use programs. | MCB 181R | On-Line, In person | F, Sp | Y |
| PSIO 427 | 3 | Metaboli sm and Disease | Students will study the biochemical principles that govern metabolism in physiological and pathophysiological states. We will discuss the underlying biochemistry and cell biology of specific diseases that disrupt normal cellular physiology including metabolic diseases, cancer, diabetes, cardiovascular and neurodegenerative diseases. Course activities include lectures, classroom discussions and oral presentations and assessments include exams, presentations and discussions. | $\begin{aligned} & \hline \text { PSIO } 201 \\ & \text { PSIO } 202 \end{aligned}$ | On-Line, In person | F, Sp | Y |
| PSIO 452 | 3 | Digestive Physiolog y | This course uses an integrative approach to introduce students to the structure and function of the digestive system, and will survey how the digestive system functions correctly, how it is regulated, and | $\begin{aligned} & \hline \text { PSIO } 201 \\ & \text { PSIO } 202 \end{aligned}$ | On-Line, In person | F, Sp | Y |


|  |  |  | some problems that occur when it does not function properly. |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| PSIO 450 | 3 | Respirato <br> ry <br> Physiolog <br> y | This course will introduce students to the structure and function of the respiratory system, including lung structure and development, physiology of the pulmonary airways, lung fluid balance, pulmonary circulation, pulmonary mechanics, gas exchange, regulation of breathing, respiration in the neonate and cardiopulmonary interactions. Each topic will be addressed from the molecular to the systems level of organization, and respiratory system disease will be used as a framework for understanding basic physiology. | $\begin{aligned} & \text { PSIO } 201 \\ & \text { PSIO } 202 \end{aligned}$ | On-Line, In person | Sp | Y |
| PSIO 465 | 3 | Neuroph ysiology | This course is concerned with how systems of neurons operate together to perform a wide array of functions including the processing of sensory information and generation of motor behaviors. Relevant aspects of neuroanatomy will be covered and some neural diseases will be discussed. A brief review of cellular neurophysiology will be provided at the outset of the course. | $\left\lvert\, \begin{aligned} & \text { PSIO } 201 \\ & \text { PSIO } 202 \end{aligned}\right.$ | On-Line, In person | Sp | Y |
| PSIO 469 | 3 | Human <br> Reproduc tive Physiolog y | We will examine contemporary issues in the field of reproductive physiology with particular emphasis on clinical applications and societal concerns. The class structure is designed to encourage application of primary scientific literature and textbook hypotheses to real-world practice and exploration of new issues. Students are encouraged to bring recent articles, newspaper clippings, opinions, ideas and questions to class to promote active learning. | $\begin{aligned} & \hline \text { PSIO } 201 \\ & \text { PSIO } 202 \end{aligned}$ | On-Line, In person | Sp | Y |
| PSIO 485 | 3 | Cardiovas <br> cular <br> Physiolog <br> y | Physiology principles of the heart, blood and peripheral vasculature, viewed in an integrative manner, from the cellular to the systems level. | $\begin{aligned} & \text { PSIO } 201 \\ & \text { PSIO } 202 \end{aligned}$ | On-Line, In person | F, Sp | Y |
| PSIO 487 | 3 | Physiolog $y$ of Aging | In this course we will examine the processes of lifecycle development, normal and pathological aging, senescence, and death from an ecophysiological perspective. Course | MCB 184 or (MCB 181R and MCB 181L)] and (ECOL 182R and 182L) and [(PSIO 201 | On-Line, In person | F, Sp | Y |



| MCB 304 | 4 | Molecula <br> r <br> Genetics | This is the second course in a three part upper division series required for MCB majors. The course will cover the foundations of genetics and genomics: 1) how cells and organisms transmit information to the next generation, 2) how the phenotypes of cells and organisms are connected to the information encoded within a DNA template, and 3) how DNA sequencing and recombinant DNA technology can be used to sequence and analyze the entire set of DNA in cells. In the first half of the course, the topics will include the mechanisms of genetic transmission, basis of traits, genome replication, and gene expression. The focus of the second half of the course will be to synthesize our understanding of these fundamental processes and to explore their application to the analysis of a wide range of biological phenomena. | MCB 181R and <br> MCB 181L, <br> Introductory <br> Biology I and <br> Laboratory CHEM <br> 105A and CHEM <br> 106A or CHEM <br> 151, General <br> Chemistry I CHEM <br> 105B and CHEM <br> 106B or CHEM <br> 152, General <br> Chemistry II | In-Person, On-Line | F |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{array}{\|l} \hline \text { PHPM } \\ 310 \end{array}$ |  | Health <br> Care in the U.S. | This course describes the structure and function of the various private and public health care entities within the United States. Strengths and weaknesses related to cost, quality and access are analyzed. Basic economic theories that drive financing are also considered. | two courses from Tier OneIndividuals/Societi es | On-line | F | Y |
| LAW 452 | 3 | Health Law | Description <br> This is a survey of the four major parts of "Health Law": (1) Regulation, Finance, and Policy; (2) Medical Liability; (3) Bioethics; and (4) Public Health. | none | In-person, on-line | F | Y |
| CMM 4793 | 3 | The Art of Scientific Discovery | This is a lab and discussion course whose purpose is to develop your skills in solving problems encountered in scientific research. You will be challenged with difficult puzzles that each teach principles in scientific problem solving. You will also study by example from the history of scientific discoveries. Topics include observation and discovery from patterns, organizational problems, overcoming challenges, generalization, synthesis, | none | On-line | F | Y |



|  |  | Populatio\|t ns | tobacco, alcohol, marijuana, and opioids) on the psychological and physical wellbeing of women, infants, and children. We will also cover current clinical guidelines for treatments and expected treatment outcomes. The course will be especially useful to pre-health science professions students (including, but not limited to, medicine, pharmacy, nursing, public health) as well as students planning a career in addiction-related fields. |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { FCM } \\ & \text { 496A } \end{aligned}$ | 2 | Advance ments in Substanc e Misuse Research and Clinical Care Seminar | This seminar is a forum for presentation and discussion of original research findings, clinical advancements, and other topics as related to the treatment of addiction and substance use disorders. Each week students will read one related article, attend the seminar, participate in a discussion after the seminar, and prepare brief reflections on the each week's topic. Students also will take turns acting as the facilitator during the discussion. The course will be especially useful to pre-health science professions students (including, but not limited to, medicine, pharmacy, nursing, public health) as well as students planning a career in addiction-related fields. | none | In-person, on-line | F | Y |
| $\begin{aligned} & \text { PSIO } \\ & \text { 497A } \end{aligned}$ | 3 | Physiolog S <br> y of Mind <br> Body <br> Interactioth ns | Students will explore the connections between their own mental/emotional processes and their physiological responses. As a result they will learn how to regulate their autonomic nervous system to reduce stress and improve performance. | $\begin{aligned} & \text { SPSIO } 201 \\ & \text { PSIO } 202 \end{aligned}$ | In-person, on-line | Sp | Y |
| IHM 401 | 1 | Integrate <br> d Health <br>  <br> Medicine <br> Foundati <br> on: <br> Mind- <br> Body- <br> Spirit: <br> Addressi | Integrated Health \& Medicine <br> Foundation: Mind-Body-Spirit: <br> Addressing Stress and Mental Health through an Integrative Lens is intended for graduate and upper division undergraduate students as an introduction to concepts and theories in mind-body medicine, the role of spirituality on health/wellness, and integrative | none | On-Line | F, Sp | Y |


|  |  | ng Stress \& Mental Health | approaches to support mental wellbeing. This course will provide students planning careers in the prehealth science professions as well as students planning a career in biomedical research, with a valuable grounding in one of the foundations of integrative health and medicine. |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| EMD 197 | 4 | Emergen cy <br> Medical Technicia n | This workshop, EMD 197, provides the medical knowledge necessary to become an Emergency Medical Technician. EMD 197 will provide a brief introduction to EMS systems, the structure and history of EMS, and will focus on providing the fundamental knowledge necessary to become an EMT. With completion of EMD 197, students will have attained the required didactic training hours to meet the National Registry of Emergency Medical Technicians (NREMT) prescribed requirements for Emergency Medical Technicians (EMT). | BLS Provider CPR certification card is required prior the first day of class | In Person, On-Line | Sp, Su | Y |
| EMD 350 | 3 | Advance <br> d <br> Emergen <br> cy <br> Medical <br> Services <br> Systems | This course will provide a broad overview of medical care provided by EMS services, the science behind EMS operations, and the legal framework under which out-ofhospital medical care is provided. Course topics will include the history and foundations of EMS, EMS systems, state and regional EMS systems, trauma systems, emergency departments and EMS, medical oversight and accountability, administration/management/28pera tion, system financing, communications, emergency medical dispatch, medical record documentation and EMS information systems, ambulance ground transport, inter-facility and specialty care transfer, air medical transport, EMS for children, rural EMS, disaster response, emergency medical care at mass gatherings, response to terrorist incidents and weapons of mass destruction, operational EMS, EMS and public health, research, EMS educational programs, EMS providers and system roles, | none | On-Line | F, Sp, Su | Y |


|  |  |  | occupational health issues, medicallegal concerns in EMS, EMS research, Emergency Medical Treatment and Labor Act (EMTALA) and EMS. |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| NSC 310 | 3 | Principles $T$ of <br> Human Nutrition in health and Disease | This course will provide a deeper understanding of the human body's nutrient requirements and utilization of those nutrients. The application of basic nutrition science principles in the selection of nutritional therapy for a wide variety of clinical disease states will also be investigated. | NSC 170C1 or NSC 101 | In Person, On-Line | F, Su | Y |
| MAS/AIS/ MED 435 | 3 | Mexican Tradition al <br> Medicine : An <br> Overview of Indigeno us Curing Cultures (3 units) | A survey of various popular and Indigenous medicinal systems that fall under the rubric known as Mexican Traditional Medicine (MTM). Mexican scholar Carlos Viesca Treviño defines MTM as medicinal knowledge(s) that emanate from Mesoamerican world views and that have adapted to historical and social conditions in the Americas. This course will explore various expressions of MTM, with a special emphasis on Indigenous medicinal approaches to healing that exemplify both continuities and adaptations. We will compare across cultures some shared values in various Indigenous systems as well as how they are uniquely expressed in contemporary settings. We will also draw from the local knowledge holders of Indigenous populations from this region to compare various approaches in traditional medicine. This course will introduce students to the relationship between place, healing and cosmology in Indigenous-based cultures that maintain curing traditions and practices. We will explore the theories and philosophies that are used in MTM as well as applied knowledge and practices that are useful for self-care and community wellness. | None | In person | S | Y |
| EHS 420 | 3 | Environm entally Acquired | Illnesses related to environmental exposures are on the rise but frequently misdiagnosed due to a lack of understanding of the | none | On-Line | Sp | Y |


|  |  | \|IInesses (3 units) | complexities of multiple hazard exposures and variable health outcomes. This course provides an overview of common and emerging Environmentally Acquired Illnesses (EAls) and explores the multitude of hazards, conditions, and predisposing factors related to human disease. Students will gain foundational knowledge of EAls and tools for environmental monitoring and mitigation as well as patient diagnosis and treatment options. |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| PCOL 406 | 5 | Compreh ensive <br> Human <br> Pharmac ology | Pharmacology is the study of how drugs change human physiology to prevent disease and to reduce/rem ove the impact of diseases. This course will present the basic principles of pharmacology, as well as instruction in the diverse mechanisms-of-action, and pharmacological effects (both desired and undesired!) of the major classes of drugs currently used to treat and prevent human diseases | PSIO 202, and CHEM 241A | in-person | F | Y |
| PCOL 310 | 2 | Drug <br> Approval: <br> The 3 <br> Billion <br> Dollar <br> Bet | Almost 60 billion dollars (2016) are :spent annually on pharmaceutical research and development in the United States and almost 425 billion dollars (2015) are spent annually in drug purchasing. Drugs are key economic and therapeutic factors in the health care arena; yet, among patients and consumers the pharmaceutical industry lacks public trust and the process of drug approval is often shrouded in mystery. In this course we'll address the decisions drug manufacturers consider, including time, cost, risk and value in bringing as new drug product to market. We will explore how a new drug product is developed from concept to bedside. | ENGL 102 | In Person | Fall | Y |
| PCOL 355 | 3 | Drug <br> Delivery Systems | The purpose of this course is to provide the student with a basis of understanding of pharmaceutical dosage forms. An overview of traditional and novel dosage forms will be presented along with a discussion on scientific and regulatory requirements necessary | CHEM 241B | In Person | Fall | Y |


|  |  |  | to get a drug product approved. The course will emphasize the relationship between Physical Pharmacy (chemistry and physical science) and the pharmaceutical dosage form. Critical thinking and problem solving will be applied to the above principals |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| PCOL 350 | 3 | ADME: <br> How the Body Changes Drugs | ADME, an acronym for absorption, distribution, metabolism, excretion, is often the determining factor in whether drugs generate the desired effect, or no effect, or a harmful effect. PCOL 350 provides students with a rounded education in the ways that the body changes the chemical form of drugs, as well as the ways that the body directs the movement of drugs over time, from administration through excretion. | PSIO 202, and CHEM 241B | In person | Fall | Y |
| $\begin{aligned} & \text { LAW } \\ & 478 \mathrm{~A} \end{aligned}$ |  | Legal and <br> Regulator <br> y Aspects <br> of <br> Healthcar <br> e <br> Delivery | his course explains the different models and facility requirements for how health care is organized and delivered. Examples include the regulations that govern inpatient and outpatient treatment facilities, and the accreditation process with the Centre for Medicare and Medicaid Services. Additional topics include the regulation of tax-exempt hospitals with their associated community benefit role, and related health care statutes for providing access to care, including EMTALA. Advances in technology, such as the regulations around telemedicine and health information exchanges will be covered. The course concludes with innovative examples of improving health care delivery in the US. | none | On-line | Fall | Y |
| $\begin{aligned} & \text { LAW } \\ & \text { 480A } \end{aligned}$ | 3 | Liability and Regulatio n of Healthcar e <br> Professio nals | his course provides an overview of the professional licensure and compliance requirements for health professionals and describes the administrative, criminal and civil processes for non-compliance. Specific topics covered include: licensure requirements, scope of practice differentiation, obligations of providers to meet professional standards and duties of care, medical error and patient safety programs, | none | On-Line | Su | Y |


|  |  |  | and professional claims litigation in both civil and criminal settings. The course concludes with training specifically designed for health professionals in the role of expert witnesses in litigation from the deposition process to trial. |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { LAW } \\ & 476 \text { A } \end{aligned}$ | 3 | Drug <br> Discoveryd <br> Develop <br> ment, <br> and <br> Innovatio a <br> $n$ to <br> Reach <br> the <br> Marketpl <br> ace | This course navigates the drug development path stretching across the pre-clinical and post-marketing divide from the full range of drug regulation, including drug discovery, innovative drug development tools, and the post-approval phase. Intellectual Property protection and evaluation will be covered, along with FDA-enforced market exclusivity and FDA-expedited review programs. The course concludes with international regulatory perspectives, including the European Medicines Agency, the costs involved to bring drugs through the clinical trials to market in the US and abroad, and how this affects future investment and strategy. | none | On-Line | Fall | Y |
| HIST 373 | 3 |  | In this course we will examine the history of health - and health care as well as the political dimensions of scientific research and medicine. Based on the understanding that health and health care are subject to political competitions on the nation state level and are mediated by changing global paradigms, we will use readings and class discussions to draw conclusions about citizenship rights in the Americas. | None | In-person | Fall, Spring | Y |
| HNRS 3053 |  | Narrative <br> Medicine and <br> Healthcar e | Through an interdisciplinary perspective, this course will investigate and evaluate the significance of Narrative Medicine and NVC (non-violent, or compassionate, communication) in the healthcare profession. Students will read, discuss, analyze, and reflect on the role of storytelling, role playing, visual and performing arts, and cultural awareness in contemporary medicine. Coursework will focus on appropriate communication between patients, caregivers, and practitioners, and in communities at large. | None | Hybrid | Spring | Y |


|  |  |  | Emphasis will be on active student engagement, creative and analytic expression, and understanding and application of Narrative Medicine resources |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| EHS 425 | 3 | A Public Health Lens to Climate Change | How does a changing environment affect human health? What is the public health role in mitigating and addressing these implications? Why is a public health lens both relevant and necessary? Students in this course will directly interact with these questions and explore the fundamentals of global environmental change with a focus on climate change. Course topics include climate change, impacts on human health, policy development, adaptation and mitigation, health equity, and climate action co-benefits. | None | On-line | Spring | Y |
| PHP 205 | 3 | Fundame ntals of Telehealt h | This course introduces students to the basic foundations of telehealth. In this course, students will learn about the human factors, technology, applications and administrative practices required for telehealth delivery. They will also be given the opportunity to disseminate telehealth information through written and verbal methods. | None | On-Line | Fall | Y |
| $\begin{aligned} & \text { PHPM } \\ & 310 \end{aligned}$ | 3 | Health Care in the US | This course describes the structure and function of the various private and public health care entities within the United States. Strengths and weaknesses related to cost, quality and access are analyzed. Basic economic theories that drive financing are also considered | For general education credit, two courses from Tier OneIndividuals/Societies | Normally in class- COVID on-line | Spring | Y |
| IMB 402 | 1 | Medical Microbiol ogy Basics | This course will present basic concepts in the areas of microbiology, including bacteriology, virology, mycology and parasitology. It will also present the pathogenesis of medically important, viral, bacterial, fungal and parasitic diseases. In addition, it will provide vocabulary that is useful in approaching the medical literature. The course will be especially useful to pre-health profession students (Medicine, Dentistry, Nursing, Pharmacy, Public Health) as well as students planning a carrier in biomedical research. | Basic microbiology and immunology course | On-line, | Fall 2020 | Y |
| FCM 302 | 3 | Clinical <br> Health Disparitie $s$ in | Sexual and Gender Minority (SGM/LGBTQ) populations face disproportionate rates of health risks compared to the general population. | none | On-line | $\begin{aligned} & \text { Fall } \\ & 2020 \mathrm{~A} \end{aligned}$ | Y |


|  |  | Sexual <br> and <br> Gender <br> Minority <br> (SGM) <br> Populatio ns | Compounding this problem are provider-level lack of knowledge and sensitivity around health issues facing SGM patients. This introductory course will review primary clinical health issues within SGM populations. Students will learn current best practices when working with SGM people and practical strategies to provide inclusive and culturally responsive care to SGM patients. |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| IMB 404 | 1 | Medical Virology Basics | This course will present basic concepts in the areas of human virology. It will also present the pathogenesis of medically important viral infectious diseases. In addition, it will provide vocabulary that is useful in approaching the medical literature. <br> The course will be especially useful to pre-health profession students (Medicine, Dentistry, Nursing, Pharmacy, Public Health) as well as students planning a carrier in biomedical research | Basic Immunology course | On-line, | Spring 2020D | Y |
| EHS 425 | 3 | A Public Health Lens to Climate Change | This course is designed to provide foundational knowledge in the various, complex mechanisms through which anthropogenic changes influence the health of the environment and subsequently human health. During this course, students will be introduced to key concepts including health risks associated with climate change and other human-mediated global environmental changes; local, regional, and national efforts underway to understand and manage the adverse impacts, and the factors influencing progress on this issue. Students will have the opportunity to engage with researchers and practitioners to learn about the current science as well as challenges and opportunities associated with identifying, managing, and addressing the health implications of climate change and other anthropogenic changes | none | On-line, | Spring 2021D | Y |

V. NEW COURSES NEEDED - using the table below, list any new courses that must be created for the proposed program. If the specific course number is undetermined, please provide level (ie CHEM $4^{* *}$ ). Add rows as needed. Is a new prefix needed? If so, provide the subject description so Curricular Affairs can generate proposed prefix options.

| Course prefix and number (includ e cross- <br> listings) | $\begin{aligned} & \hline \mathrm{U} \\ & \mathrm{n} \\ & \text { it } \\ & \mathrm{S} \end{aligned}$ | Title | Course Description | Prerequis ites | Modes of delivery (online, inperson, hybrid) | $\begin{aligned} & \text { St } \\ & \text { at } \\ & \text { us } \end{aligned}$ | Anticip ated first term offere d | Typical <br> ly <br> Offere <br> d <br> (F, W, <br> $\mathrm{Sp}, \mathrm{Su}$ ) | Dept <br> signed <br> party <br> to <br> propos <br> al? <br> (Yes/N <br> o) | Faculty membe <br> rs <br> availabl <br> e to <br> teach <br> the <br> courses |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \hline \text { MED } \\ & 101 \end{aligned}$ | 2 | Introdu ction to <br> Medical Care | This course will provide an overview of medical issues and systems within fields of medicine. The course is intended as an introduction to case-based problems and teach approaches to knowledge acquisition and problem solving that are basic for multiple professional fields within medicine. The course will provide students planning careers in the pre-health science professions (Medicine, Pharmacy, Nursing, Public Health, etc.), as well as students planning a career in biomedical research, policy work, advocacy. This will serve as well to promote health literacy and a familiarity with the issues of providing medical care at a personal through a professional through a public policy level. This course should serve as both a stimulus to foster further learning in these areas, as well as an introduction to basic medical and societal concerns. Integral to the course will be exploration of potential roles students may assume in the various realms of medical care. | none | hybrid | S | $\begin{aligned} & \hline \text { Fall } \\ & 2021 \end{aligned}$ | F, Sp | Yes | Yes |
| $\begin{aligned} & \hline \text { MED } \\ & 296 \end{aligned}$ | 2 | Careers in <br> Medical <br> -Health <br> Science <br> s | This course is an introductory Core course in the BS in Medicine concentration. It will provide students an opportunity to gain insight into the various disciplines involved in medicine and health sciences. These will include Medicine, Nursing, Public Health, Pharmacy, | none | hybrid | S | $\begin{aligned} & \hline \text { Fall } \\ & 2021 \end{aligned}$ | F, Sp | Yes | Yes |


|  |  |  | Biomedical Engineering, Social Work, Psychology, Nutrition, Occupational/Physical Therapy and Law. Through an interactive format, students will be challenged with various patient cases to consider the role that each of these disciplines plays in the care of the patient. |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { SURG } \\ & 401 \end{aligned}$ | 2 | Virtual <br> Medical <br> Care <br> Trainin <br>  <br> Educati <br> on in <br> the <br> Digital <br> Age | In this four-week 5 credit elective, Summer Session Course, the Arizona Telemedicine Program (ATP) and the Arizona Simulation <br> Technology and Education Center (ASTEC) will use both individual and group interactive on-line formats to explore resources available to medical personnel and educators in the age of COVID-19, including: interactive virtual patients, on-line medical games, and virtual cadavers. Students will be taught how to critically analyze these resources in the context of healthcare learning objectives and be guided in applying on-line modules within a lesson plan. Students will also receive specific instruction in how to use telemedicine equipment to interview and examine patients. | None | Inperson, online | S | $\begin{aligned} & \text { Summ } \\ & \text { er } \\ & 2022 \end{aligned}$ | Summ <br> er 2 ${ }^{\text {nd }}$ <br> sessio <br> n | Yes | Yes |
| $\begin{aligned} & \hline \text { MED } \\ & 441 \end{aligned}$ | 3 | Introdu ction to Medical Devices and Their Utilizati on | This course will provide a broad overview of the field of medical devices. A context of medical practice will be framed at the outset including the evolution of the health encounter and the parallel emergence | $\begin{aligned} & \hline \text { PSIO } \\ & 201, \\ & \text { PSIO } \\ & 202 \end{aligned}$ | On-line, in person | S | Spring 2022 | Sp | Yes | Yes |


|  |  |  |  |  |  |  |  |
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|  |  |  | to address the need. <br> The structure of the course will allow students to complete their field project over a 16 week period. <br> Students will work in groups and be paired with organizations focused on addressing area health needs. Students will research the health needs of the community (using existing data sources such as community health needs assessments), identify a health need that they find of importance, then work with a community agency or internal U of A program to implement a project to address the need. |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \hline \text { FCM } \\ & 496 E \end{aligned}$ | 3 | Introdu <br> ction to <br> Populat <br> ion <br> Health <br> Manag <br> ement | This course is part of the BS in Medicine concentration. It will provide students with an in-depth understanding of population health management and how to implement and manage these types of initiatives. Population health management is a growing area of importance within the health care field and providers are being expected to take the lead on these initiatives within the communities they serve. This broader perspective to health requires providers to take responsibility for improving the health status of an entire group of individuals. ... | none | On-line, inperson | S | $\begin{aligned} & \text { Spring } \\ & 2022 \end{aligned}$ | Sp | Yes | Yes |
| $\begin{aligned} & \text { PHCL } \\ & 386 \end{aligned}$ | 3 | Introdu ction to Tech Transfe $r$ in | Intellectual property (patents, copyrights, trademarks) are an increasingly critical part of university impact and medical translation. | none | On-line, inperson | S | Spring <br> 2022 | Sp | Yes | Yes |


|  |  | Medici <br> ne | This introductory <br> course is aimed at <br> undergraduates in <br> health sciences <br> interested in exploring <br> intellectual property <br> and commercialization <br> of medtech. Specific <br> topics will include: the <br> history and legislation <br> that drive technology <br> transfer; the role of a <br> university's tech <br> transfer office; types of <br> intellectual property <br> including patents and <br> copyrights and what <br> makes someone an <br> inventor or contributor; <br> and the entire <br> translation process <br> (with a focus on <br> medtech) including <br> patent and market <br> analysis, patent <br> application, licensing <br> and more. ... |  |  |  |
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| $\begin{aligned} & \hline \text { FCM } \\ & 303 \end{aligned}$ | 1 | Difficult <br> Convers <br> ations <br> in <br> Patient <br> Care: <br> The Art <br> of <br> Empath <br> y | This course will discuss how medical professionals deal with difficult patient discussion, how to address the family, patient rights and what types of things cannot be stated. How health care providers themselves deal with losses and when they have to be the ones to tell the family. | none | On-line, inperson | S | Spring <br> 2022 | Sp | Yes | Yes |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { NSC } \\ & 2^{* *} \end{aligned}$ | 3 | Funda mentals of Precisio n <br> Nutritio n and Wellnes s | This course is designed to teach the fundamental concepts of nutrition and wellness including disease prevention and wellness at an individual/population level through transformative advances in understanding the relationship between nutrition, lifestyle, genomics, metabolomics, and human evolution | None | Inperson, | S | $\begin{aligned} & \hline \text { Spring } \\ & 2022 \end{aligned}$ | $\begin{aligned} & \hline \text { F, SP, } \\ & \text { Su } \end{aligned}$ | Yes | Yes |
| $\begin{aligned} & \text { MED } \\ & 3^{* *} \end{aligned}$ | 3 | Parallel <br> History <br> of <br> Medici <br> ne and <br> Law | This course is an overview of comparative history for the Bachelor of Science degree for Medicine or Law. The Parallel History of Medicine and Law is an opportunity for students to consider the chronological discovery, development and progression of medical knowledge compared to the advancement of laws and legal concepts within the same eras. The course reviews the circumstances of health and disease that occurs historical periods as | None | In <br> Person and Online | S | $\begin{aligned} & \text { Spring } \\ & 2022 \end{aligned}$ | Sp | Yes | Yes |


|  |  |  | government, civil and individual rights. |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { FCM } \\ & 424 \mathrm{~A} / \\ & 524 \mathrm{~A} \end{aligned}$ | 1 | Arts and Commu nity Health: <br> Intercul tural <br> Perspec tives and Applica tions: <br> Part IFounda tion | This co-taught course provides an overview of how creative arts practices have been implemented to promote community health and wellness. Interdisciplinary in nature, the course draws on existing theoretical frameworks, practices, and research methods from both the arts and health sciences, and seeks to promote interprofessional dialogue about how to expand the contributions of creative arts in promoting healthy communities. This first course of a three part 1credit course series focuses on the foundation of inclusive arts perspectives and applications from different disciplines | none | Hybrid | S | $\begin{aligned} & \hline \text { Fall } \\ & 2021 \end{aligned}$ | F,Sp | Y | Y |
| $\begin{aligned} & \text { FCM } \\ & 424 \mathrm{~B} / \\ & 524 \mathrm{~B} \end{aligned}$ | 1 | Arts and <br> Commu nity <br> Health: <br> Part II - <br> Focus <br> on <br> Disabilit ies and Client- <br> Centere <br> d <br> Practice <br> s | This co-taught course provides an overview of how creative arts practices have been implemented to promote community health and wellness. Interdisciplinary in nature, the course draws on existing theoretical frameworks, practices, and research methods from both the arts and health sciences and seeks to promote inter-professional dialogue about how to expand the contributions of creative arts in promoting healthy | none | Hybrid | S | $\begin{aligned} & \hline \text { Fall } \\ & 2021 \end{aligned}$ | F,Sp | Y | Y |


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| $\begin{aligned} & \hline \text { MED } \\ & 4^{* *} \end{aligned}$ | 3 | Skills <br> for <br> advanc <br> ement; <br> work <br> place <br> professi <br> onalism <br> resume <br> writing, <br> intervie <br> wing <br> techniq <br> ues, <br> underst <br> anding <br> HIPAA | This course will be taught by professional health care workers to help with building ones portfolio for a career in health care, how to act and what to expect in a professional health care atmosphere, give writing techniques at all levels (medical notes to writing papers, cases and grants) to understanding HIPAA laws. |  | On-line, inperson | D | $\begin{aligned} & \hline \text { Fall } \\ & 2023 \end{aligned}$ | F | Yes | Yes |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \hline \text { FCM } \\ & 431 \end{aligned}$ | 3 | Creativ e Arts in <br>  <br> Wellnes s | This course focuses on the use of visual arts to promote the physical, cognitive, psychological, and emotional growth and health. Art expression is explored both as a form of nonverbal communication and as a healing agent. Students will be required to complete four major projects, read the texts, and other assigned readings. Topics for this course change annually to include special emphasis in issues related to children, adolescents, adults and older adults. | none | On-line | D | Spring 2022 | Sp | Yes | Yes |
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*In development (D); submitted for approval (S); approved (A)
Subject description for new prefix (if requested). Include your requested/preferred prefix, if
any:
NOTE: I have moved all approved courses to Section IV
VI. FACULTY INFORMATION- complete the table below. If UA Vitae link is not provided/available, attach a short CV (2-3 pages) to the end of the proposal or upload to the workflow form (in the "Letter(s) of Support" field). UA Vitae profiles can be found in the UA directory/phonebook. Add rows as needed. Delete the EXAMPLE rows before submitting/uploading. NOTE: full proposals are distributed campus-wide, posted on committee agendas and should be considered "publicly visible". Contact Office of Curricular Affairs if you have concerns about CV information being "publicly visible".

| Faculty Member | Involvement | UA Vitae link or "CV <br> attached" |
| :--- | :--- | :--- |
| Todd Vanderah | Chair, organizing committee; Dept Head, <br> Pharmacology | Todd Vanderah, PhD |
| Claudia Stanescu | Member, organizing committee; Physiology | $\underline{\text { Claudia Stanescu, PhD }}$ |
| Helen Amerongen | Member, organizing committee; Cellular and <br> Molecular Medicine | Helen Amerongen, PhD |
| Paul Gordon | Member, organizing committee; Family and <br> Community Medicine | $\underline{\text { Paul Gordon, MD }}$ |
| Tejal Parikh | Member, organizing committee; Family and <br> Community Medicine | $\underline{\text { Tejal Parikh, MD }}$ |
| Arthur Gmitro | Member, organizing committee; Dept Head, <br> Biomedical Engineering | Arthur Gmitro, PhD |
| Carol Gregorio | Dept Head, Cellular and Molecular Medicine; <br> Executive Director, UArizona Health Sciences <br> Global and Online, Assistant Vice Provost for <br> Global Health Sciences <br> Member, organizing committee | Carol Gregorio, PhD <br> Nafees Ahmad <br> Robert SegalMember, organizing committee; <br> Immunobiology |
| Alicia Allen | Member, organizing committee; Medicine | $\underline{\text { Rafees Ahmad, PhD }}$ |
| Roger Miesfeld Segal, MD |  |  |

VII. FOUR-YEAR PLAN - provide a sample four-year degree plan that includes all requirements to graduate with this major and takes into consideration course offerings and sequencing. Refer to Degree Search for examples. Use generic title/placeholder for requirements with more than one course option (e.g. Upper Division Major Elective, Minor Course, Second Language, GE Tier 1, GE Tier 2). Add rows as needed.

| Semester 1 |  | Semester 2 |  | Semester 3 |  | Semester 4 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Course prefix and number | Unit S | Course prefix and number | Unit S | Course prefix and number | Unit s | Course prefix and number | Unit S |
| $\begin{aligned} & \hline \text { CHEM } \\ & 141 / 143 \end{aligned}$ | 4 | $\begin{aligned} & \hline \text { CHEM } \\ & 142 / 144 \end{aligned}$ | 4 | $\begin{aligned} & \hline \text { CHEM } \\ & 241 \mathrm{~A} / 246 \mathrm{~A} \end{aligned}$ | 3 | Tier 1 Gen <br> Edtanguage | $\underline{3} 4$ |


| $\begin{aligned} & \text { ENGL } \\ & \text { 101/107/109 } \\ & \text { H } \end{aligned}$ | 3 | ENGL 102 | 3 | $\begin{aligned} & \text { CHEM } \\ & 243 \mathrm{~A} / 247 \mathrm{~A} \end{aligned}$ | 1 | $\frac{\text { Tier } 1 \text { Gen EdPHys }}{102}$ | 33 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Tier 1 Gen Ed | 3 | $\begin{aligned} & \hline \text { MATH } \\ & 263 / 376 \end{aligned}$ | 3 | $\begin{aligned} & \text { PHYS 141Tier 1 } \\ & \text { GenEd } \\ & \text { PHYS } 142 \\ & \hline \end{aligned}$ | $\underline{43}$ | PHYS 241181 <br> PHYS 242 | $\underline{4}$ |
| $\begin{aligned} & \text { MCB 181R } \\ & \text { ECOL 181R } \end{aligned}$ | 43 | $\frac{\text { MED } 101}{\frac{\text { intro } F C M}{201}}$ | $\underline{23}$ | $\begin{aligned} & \text { FCM 201Tier } 1 \\ & \text { Gen Ed } \end{aligned}$ | $\underline{3}$ | $\frac{\text { PSIO 202Tier IIGen }}{\text { Ed }}$ | 43 |
| $\text { MED } 101$ <br> intre | $z$ | Tier 1 <br> GenEd <br> ECOL 182 | 43 | PSIO 201 | 4 | $\begin{aligned} & \text { MED } 296 \\ & \frac{\text { seminar/careerPS }}{\theta-202} \end{aligned}$ | $\underline{2}$ |
|  |  |  |  | AED 296 seminar/caree f | $z$ |  |  |
| Total | 145 | Total | 166 | Total | 156 | Total | 165 |


| Semester 5 |  | Semester 6 |  | Semester 7 |  | Semester 8 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Course prefix and number | Units | Course prefix and number | Units | Course prefix and number | Units | Course prefix and number | Units |
| BIOC 384/385 | 3 | CMM 410 | 3 | FCM 496D | 3 | $\begin{aligned} & \text { IMB 401/PSIO } \\ & 431 \end{aligned}$ | 3 |
| Tier 1 Gen Edtanguage II | $\underline{3} 4$ | MED 441 device | 3 | PHCL 412 | 3 | Elective | 3 |
| CMM 459 \& 461 | 2 | MED 401 ethics | 3 | PATH 415 | 3 | Elective | 3 |
| Tier It Gen Ed | 3 | Tier II Gen <br> EdAajor <br> Electives | 3 | Tier II Gen EdElective | 3 | Elective | $\underline{3} 4$ |
| Tier II Gen Ed | 3 | PSIO 467 | 3 | Elective | 3 | Elective | 3 |
| Total | 145 | Total | 15 | Total | 15 | Total | 153 |

VIII. STUDENT LEARNING OUTCOMES AND CURRICULUM MAP—describe what students should know, understand, and/or be able to do at the conclusion of this major. Work with Office of Instruction and Assessment to create a curricular map using Taskstream. Include your curricular map in this section (refer to Appendix C for sample Curriculum Map generated using Taskstream).

## At the successful completion of this major, students will be able to

1. Demonstrate in-depth knowledge of the structure and function of the human body in health and disease including use of appropriate medical terminology, and apply this knowledge to evaluation of disease therapies (courses include)
MED 101 Introduction to Medical Care - Required
CMM 459 \& 461 Clinical Reasoning and Medical Case Based Learning- Required
CMM 410 Human Histology: An Intro to Pathology- Required
PSIO 467 Endocrine Physiology
IMB 401 Medical Microbiology \& Immunology- Required

PHCL 412 Intro to Pharmacology- Required
PCOL 406 Comprehensive Human Pharmacology
PATH 415 Mechanisms of Human Diseases- Required
CMM 401 Gross Anatomy
EMD 197 - Emergency Medical Technician
2. Demonstrate knowledge of the scope of medical device technology as well as the complex datasets generated and their application to the practice of precision medicine. (courses include) MED 296 Seminar- Careers in Medical-Health Sciences - Required
MED 441 Introduction to Medical Devices and Their Utilization - Required
to be required under emphases Med \& Technology
BME 477 Introduction to Bioinformatics to be required under emphases
BME 486 Biomaterial-Tissue Interactions
PHCL 386 Medical Tech Transfer
CSC 250 Essential Computing for the Sciences- to be required under emphases Med \&
Technology New: Technology and Big Data in Individualized Care
SURG 401 Virtual Medical Care Training \& Education in the Digital Age
LAW 476A - Drug Discovery, Development, and Innovation to Reach the Marketplace- to be
required under emphases Med \& Technology
MED 4** Clinical Applications of Medical Technology
PHP 205 - Fundamentals of Telehealth
3. Describe social determinants of health including racial/ethnic disparities, and apply scientific evidence, best practices, and professional judgment to proposing strategies to mitigate negative impacts of social factors on health outcomes. (courses include)
FCM 496D Disability Perspectives in Research, Policy, and Practice- Required
New MED 401 Medical Ethics and Professionalism- Required
PHPM 310 Health Care in the U.S.-to be required under emphases Med \& Society
FCM 496E Introduction to Population Health Management
EHS 420 Environmentally Acquired Illnesses - to be required under emphases Med \& Society
FCM 302 Clinical Health Disparities in Sexual and Gender Minority (SGM) Populations-to be required under emphases Med \& Society
HNRS 305 Narrative Medicine and Healthcare
New FCM 402 Addressing Health Disparities through Interprofessional Clinical-Community Collaboration "In the Field Course"
PHP 205 - Fundamentals of Telehealth
HPS 433 Global Health
AIS/MAS/MED 435 Mexican Traditional Medicine: An Overview of Indigenous Curing Cultures
NSC 310 Principles of Human Nutrition in Health and Disease
FCM 301 Substance Misuse in Maternal and Child Health Populations
FCM 496A Advancements in Substance Misuse Research and Clinical Care Seminar
4. Demonstrate understanding of professional and ethical responsibility in independent and/or multidisciplinary team settings. (courses include)

New MED 296 Seminar- Careers in Medical-Health Sciences- Required
New FCM 401 Medical Ethics and Professionalism- Required
FCM 201 Being a Healthcare Professional - Required
PSIO 411 Scientific Methods and Professional Ethics to be required under emphases Med \& Society
MED/PHIL 321 Medical Ethics to be required under emphases Integrative and Practice-Focused Medicine
LAW 480A - Liability and Regulation of Healthcare Professionals
IHM 401/501 Integrated Health \& Medicine Foundation: Mind-Body-Spirit: Addressing Stress \&
Mental Health to be required under emphases Integrative and Practice-Focused Medicine
New FCM 303 Difficult Conversations in Patient Care: The Art of Empathy
EMD 350 - Advanced Emergency Medical Services Systems
New MED 301 Healthcare Professional Well-being
5. Demonstrate skills needed to engage in life-long learning, including the ability to find and critically evaluate relevant information, and apply it to solving clinical problems. (courses include)
FCM 201 Being a Healthcare Professional- Required
PHCL 412 Intro to Pharmacology- Required
New BME 401 Introduction to Medical Devices and Their Utilization- Required
MED 4** Clinical Applications of Medical Technology
New FCM 4** Community Health Field Training Experience
New PATH 4** Clinical Skills (path, pharm, phlebotomy, EKG, imaging, etc.)
New FCM 4** Reflections on Clinical Medicine through Clinical Shadowing
CMM 459 \& 461 Clinical Reasoning and Medical Case Based Learning to be required under
emphases Integrative and Practice-Focused Medicine
HIST 311 History of Epidemics- Cross list as MED 311
CMM 479 Art of Scientific Discovery
PHCL 386 Intro to Tech Transfer in Medicine
SURG 401 Virtual Medical Care Training \& Education in the Digital Age
IHM 401/501 Integrated Health \& Medicine Foundation: Mind-Body-Spirit: Addressing Stress \& Mental Health
PHP 205 - Fundamentals of Telehealth
PHCL 430 Pain to be required under emphases Integrative and Practice-Focused Medicine PCOL 410 Pharmacogenomics and Precision Medicine to be required under emphases
Integrative and Practice-Focused Medicine
PCOL 355 Drug Delivery Systems

## Curriculum Map:

University of Arizona AMS $n$ College of Medicine - Tucso
BS Medicine
BS Medicine Curriculum Map
Courses and Activities Mapped to BS Medicine Outcome Set

| Outcome |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Outcome 1: <br> Structure \& Function Demonstrate in-depth knowledge of the structure and function of the human body in health and disease, including use of appropriate medical terminology, and apply this knowledge to evaluation of disease therapies. | Outcome 2: Medical Device Technology Demonstrate knowledge of the scope of medical device technology, as well as the complex datasets generated and their application to the practice of precision medicine. | Outcome 3: Socia <br> Determinants Describe social determinants of health, including racialethnic disparities, and apply scientific evidence, best practices, and professional judgment to proposing strategies to mitigate negative impacts of social factors on health outcomes. | Outcome 4: <br> Professional \& Ethical Responsibility Demonstrate understanding of professional and ethical responsibility in independent and/or multidisciplinary team settings. | Outcome 5: LifeLong Learning Demonstrate skills needed to engage in life-long learning. including the ability to find and critically evaluate relevant information, and apply it to solving clinical problems. |


| Courses and Learning Activitles |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| PHCL 412 Intro to Pharmacology |  | A |  |  |  |  |  |  |
| PATH 415 <br> Mechanisms of Human Diseases |  | A |  |  |  |  |  |  |
| PSIO 467 <br> Endocrine Physiology |  | A |  |  |  |  |  |  |
| BME $4^{\text {x }}$ <br> Introduction to Medical Devices and Their Utilization |  |  |  | A |  |  |  |  |
| FCM 496D Disability Perspectives in Research, Policy and Practice |  |  |  |  | A |  |  |  |
| MED $4^{\text {I }}$ <br> Medical Ethics and Professionalism |  |  |  |  |  |  | A |  |
| CMM 459 Clinical Reasoning |  |  |  |  |  |  |  | A |
| CMM 461 <br> Medical Case Based Learning |  |  |  |  |  |  |  | A |
| Legend: I Int | introduced |  | P | Practiced | A | Assessed |  |  |

IX. ASSESSMENT PLAN FOR STUDENT LEARNING- using the table below, provide a schedule for program assessment of intended student learning outcomes 1) while students are in the program and 2 ) after completion of the major. Add rows as needed. Delete EXAMPLE row.
X.

| Learning Outcomes | Sources(s) of <br> Evidence | Assessment <br> Measures | Data Collection <br> Points |
| :--- | :--- | :--- | :--- |
| Demonstrate in-depth <br> knowledge of the <br> structure and function <br> of the human body in <br> health and disease <br> including use of <br> appropriate medical <br> terminology, and apply <br> this knowledge to <br> evaluation of disease <br> therapies. | Demonstrated <br> content knowledge | Embedded exam <br> questions, | PSIO 467 <br> PATH 415 <br> PHCL 412) |
| Demonstrate <br> knowledge of the scope <br> of medical device <br> technology as well as <br> the complex datasets <br> generated and their <br> application to the <br> practice of precision <br> medicine. | Demonstrated <br> content knowledge | Course-embedded <br> assessments | MED 441 |
| Describe social <br> determinants of health <br> including racial/ethnic <br> disparities, and apply <br> scientific evidence, best <br> practices, and <br> professional judgment <br> to proposing strategies <br> to mitigate negative <br> impacts of social factors <br> on health outcomes. | Pre-post knowledge <br> of health disparities | Pre-post assessment <br> of health disparities | FCM 496D |
| Demonstrate <br> understanding of <br> professional and ethical <br> responsibility in <br> independent and/or <br> multidisciplinary team <br> settings. | Pre-post knowledge <br> of medical ethics and <br> professionalism | Pre-post assessment <br> of medical ethics and <br> professionalism | MED 401 Medical Ethics <br> and Professionalism OR |
| Demonstrate skills <br> needed to engage in <br> life-long learning, | Skill at evidence- <br> based decision <br> making | Grading rubric for <br> clinical case <br> interpretation | CMM 459 \& 461: Clinical <br> Reasoning \& Working <br> Clinical Cases (2 units) |


| including the ability to <br> find and critically <br> evaluate relevant <br> information, and apply <br> it to solving clinical <br> problems. |  |  |  |
| :--- | :--- | :--- | :--- |
| Learning Outcomes Sources(s) of <br> Evidence Assessment <br> Measures Data Collection Points |  |  |  | 

XI. PROGRAM ASSESSMENT PLAN- using the table below, provide a schedule for program evaluation 1) while students are in the program and 2 ) after completion of the major. Add rows as needed. Delete EXAMPLE rows.

| Assessment Measure | Source(s) of Evidence | Data Collection Point(s) |
| :--- | :--- | :--- |
| Program Evaluation <br> Length of time to graduation <br> Student program assessment <br> Academic Program Review | Department generated statistics <br> Department Senior Exit Survey <br> Student/Alumni Survey | Every Year <br> During Spring semester of <br> senior <br> At graduation and as part of <br> alumni survey |
| Completion Evaluation <br> Job Placement Statistics <br> Graduate/Professional Program <br> Enrollment | Student/Alumni Survey/Social <br> Media <br> Reviewers' responses | At graduation and as part of <br> alumni survey, 2,5, 7 and <br> every 7 years after that for <br> APR |

XII. ANTICIPATED STUDENT ENROLLMENT-complete the table below. What concrete evidence/data was used to arrive at the numbers?

| 5-YEAR PROJECTED ANNUAL ENROLLMENT |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
|  | $1^{\text {st }}$ Year | $2^{\text {nd }}$ Year | $3^{\text {rd }}$ Year | $4^{\text {th }}$ Year | $5^{\text {th }}$ Year |
| Number of <br> Students | 100 | 250 | 400 | 550 | 750 |

Data/evidence used to determine projected enrollment numbers:
Projected annual enrollment was determined using data from current UA programs including Pharmaceutical Sciences and the Physiology Medical Sciences Program for comparison. The Pharmaceutical Sciences was launched in fall 2019 with 16 students graduating in May of 2020 and current enrollment for FY21 is 288 confirmed majors. The Physiology Program had 1,526 enrolled in the Spring of 2020. Based on these two programs, we estimate that we would have 100 incoming freshmen and grow by 50 students a year, with around 750 in five years.
XIII. ANTICIPATED DEGREES AWARDED- complete the table below, beginning with the first year in which degrees will be awarded. How did you arrive at these numbers? Take into consideration departmental retention rates. Use National Center for Education Statistics College Navigator to find program completion information of peer institutions offering the same or a similar program.

| PROJECTED DEGREES AWARDED ANNUALLY |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  | $1^{\text {st }}$ Year | $2^{\text {nd }}$ Year | $3^{\text {rd }}$ Year | $4^{\text {th }}$ Year | $5^{\text {th }}$ Year |
| Number of <br> Degrees | 30 | 150 | 300 | 600 | 900 |

These numbers were derived based on the assumption that the trend in graduates will trail behind the estimated enrollment due to attrition and time to complete the requirements, which is expected to be 2-3 years.

## XIV. PROGRAM DEVELOPMENT TIMELINE- describe plans and timelines for 1) marketing the

 major and 2) student recruitment activities.Once approved, we would like the degree to be offered in the Fall of 2021. Many of the courses will be available via online. All new courses are currently being put together with a designated course director(s) identified and indicated above. We anticipate that all new course submissions will be complete by the Spring of 2021.

Once approved, marketing will begin immediately with dedicated staff in the Health Sciences and College of Medicine (Tucson and Phoenix) to advertise the major on their College and Department websites as well as social media often used for prospective students, parents, and employers. These include programs on Facebook, Snapchat, Pandora/Spotify, Google and online channels to generate requests for more information. The College of Medicine-T \& P will reach out to offer this degree nation-wide via the AAMC and other health related professional societies. College advisors will host online recruitment events in Phoenix, Tucson, Flagstaff and rural areas of the State of Arizona. Live recruitment events will occur in Spring. Recruitment activities will include but are not limited to; 1) high school recruitment events including tabling at college fairs and presenting at high school student leadership conferences, 2) College of Medicine (T \& P) will go to targeted high schools throughout AZ and select out of state colleges to promote UArizona and all majors including the NEW BS in Medicine, 3) advisors attend campus recruitment events (i.e., "Meet your Major Fair"), 4) health professionals will be asked to give Q\&A on careers in their field, 5) events at community colleges across the state of AZ.
XV. DIVERSITY AND INCLUSION-describe how you will recruit diverse students and faculty to this program. In addition, describe retention efforts in place or being developed in order to retain students.

Both Colleges of Medicine ( $T$ \& P) recruit diverse students through several practices: 1) the COM has its own dedicated Deputy Dean and Office dedicated to diversity and inclusion, 2) A diverse group of academic advisors and college level faculty and staff interact with students 3 )

COM and all its departments are very proactive about ensuring that students of diverse backgrounds are reflected in relevant materials including for recruitment and marketing. There are student progress committees for retention efforts with members that reflect a diverse population.

The COM (T\&P) have committees focused on diversity and inclusion; these committees offer professional development opportunities to staff and faculty on topics which advance perspectives on best practices for fostering an inclusive environment on campus. Faculty from diverse backgrounds are and will continue to be recruited through professional health care- and research-based strategies which search committee members learn at Faculty Recruitment Workshops provided by Victoria Murrain (Deputy Dean, Diversity and Inclusion) and Human Resources. Such strategies include writing position descriptions which speak to the unit's commitment to diversity and inclusion and the value we place as a unit on joining diverse perspectives in departmental initiatives and curriculum as well as casting a very large net to advertise positions and assembling search committees with diverse representation.
XVI. ABOR REQUIREMENT: New Academic Program Request. This section is required by ABOR. Most of the information can be copied/pasted from completed sections above. Instructions/clarification for completing the table below, from ABOR, can be viewed/downloaded here.

University: University of Arizona

| Name of Proposed Academic Program: BS in Medicine |
| :--- |
| Academic Units: College of Medicine - Departments of Pharmacology, Cellular and Molecular Medicine, <br> Physiology, Family Community Medicine, Immunobiology, Pathology, Biochemistry, Medicine, College of <br> Engineering - Biomedical Engineering |
| Geographic Site: Tucson, Arizona |
| Instructional Modality: Online and in class |
| Total Credit Hours: 120 |
| Proposed Inception Term: Fall 2021 <br> Brief Program Description: <br> The Bachelor of Science in Medicine is a four-year degree program designed and delivered as a <br> collaboration between clinicians, basic scientists and humanists, with focus on clinical reasoning and <br> case-based learning. The Program juxtaposes applied topics such as what it is to be a health care <br> provider, clinical case analysis, medical ethics, professionalism, health care delivery to improve quality <br> care, and hands-on experience through simulation, with topics in the human medical sciences, <br> including advanced anatomical, biochemical, neurological, and physiological science, pathology of <br> disease, mechanisms of treatment, and integrative therapies. <br> Learning Outcomes and Assessment Plan: <br> At the successful completion of this major, students will be able to |

1. Demonstrate in-depth knowledge of the structure and function of the human body in health and disease including use of appropriate medical terminology, and apply this knowledge to evaluation of disease therapies 2. Demonstrate knowledge of the scope of medical device technology as well as the complex datasets generated and their application to the practice of precision medicine.
2. Describe social determinants of health including racial/ethnic disparities, and apply scientific evidence, best practices, and professional judgment to proposing strategies to mitigate negative impacts of social factors on health outcomes.
3. Demonstrate understanding of professional and ethical responsibility in independent and/or multidisciplinary team settings.
4. Demonstrate skills needed to engage in life-long learning, including the ability to find and critically evaluate relevant information, and apply it to solving clinical problems.
```
Methods of Assessment
Embedded exam questions,
Exit survey
Pre-post assessment of health disparities
Pre-post assessment of medical ethics and professionalism
Grading rubric for clinical case interpretation
```


## Projected Enrollment for the First Three Years:

Year $1=250$
Year 2 $=500$
Year 3 $=1000$

## Evidence of Market Demand:

Healthcare consumes nearly one-fifth of the US economy with projections of job growth at $>30 \%$ for the next 10 to 20 years.
A powerful signal of rising demand for healthcare services and healthcare workers is how much money is projected to be spent on healthcare in the future. More than doubling from 2010 to 2026, when it reaches beyond $\$ 5.7$ trillion, expenditures include payments for all healthcare costs, including pharmaceuticals, equipment and technology. Expenditures will rise for many reasons, but growing demand for the services of healthcare workers is a very significant reason.
Healthcare employment growth has been thriving since the end of the recession. The US Bureau of Labor Statistics Current Employment Statistics has shown month after month growth in healthcare employment since 2013, when there were only small declines in three separate months, with the rest of the year showing monthly increases. After that year, healthcare job growth has been robust, reaching a single-month growth record of more than 45,000 new jobs filled.

## Similar Programs Offered at Arizona Public Universities:

ASU - Medical Studies (BS)

## New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):

2 Academic Advisors (1.0 FTE ea) as well as an approved plan to increase 1 academic advisor per every additional 200-300 students enrolled. This plan will allow for rapid escalation of student advisors based on the number of students enrolled.
1 Director (1.0 FTE) and 1 Co-Director ( 0.5 FTE ), upon escalation the co-Director will be approved at a ( 1.0 FTE ) 1 Educational/Technology Specialists ( 1.0 FTE ) with a plan of one additional Educational/Technology Specialist for every 500 additional students enrolled.
1 Staff (1.0 FTE) with a plan of one additional Staff hire for every 500 additional students enrolled.
These positions are approved by leadership (see letters of support from Drs. Dake and Abecassis).
Program Fee/Differentiated Tuition Required? $\quad$ YES $\square$ NO X $\quad$ Estimated Amount:

Program Fee Justification:

Specialized Accreditation? YES $\square$ NO X

Accreditor:

Appendix A. Minor Requirements. Complete if requesting a corresponding minor. Delete EXAMPLE column before submitting.

| Minimum total units required | EXAMPLE |  |
| :--- | :--- | :--- |
| Minimum upper-division units required |  |  |
| Total transfer units that may apply to the minor |  |  |
| List any special requirements to <br> declare/admission to this minor (completion of <br> specific coursework, minimum GPA, interview, <br> application, etc.) |  |  |
| Minor requirements. List all minor <br> requirements including core and electives. <br> Courses listed must include course prefix, <br> number, units, and title. Mark new coursework <br> (New). Include any limits/restrictions needed <br> (house number limit, etc.). Provide <br> email(s)/letter(s) of support from home <br> department head(s) for courses not owned by <br> your department. |  |  |
| Internship, practicum, applied course <br> requirements (Yes/No). If yes, provide <br> description. |  |  |
| Additional requirements (provide description) |  |  |
| Any double-dipping restrictions (Yes/No)? If yes, <br> provide description. |  |  |

Date: 4/30/2021
To: University of Arizona Faculty Senate
Dear Senators,
We are writing to provide an update with regards to the proposal from the College of Medicine for a B.S. in Medicine. Unfortunately, despite our attempts to collaborate with representatives from the COM, no resolution has been reached. An email is attached at the end of this memo detailing the compromise plan that we proposed during our 4/14/21 meeting.

The majority of concerns raised by the Undergraduate Council and others during the discussion of this proposal have not been resolved. The purpose of the UGC is to carefully review new programs and policies regarding undergraduate education to determine if they are in the best interest of students and the university, making recommendations to the Faculty Senate. The UGC received an initial proposal which was shared by members with their colleges. Several faculty members responded with letters of objection, which were forwarded to the College of Medicine. Dr. Vanderah provided a written response to the UGC. The UGC carefully reviewed the proposal, letters of objection and Dr. Vanderah's response. They discussed these at length with Dr. Vanderah on $3 / 30$. At that time, the UGC voted against the proposal (5 Yea, 9 Nay, 5 Abstain). All of these materials were provided to the Faculty Senate on 4/5. Since that time, the College of Medicine has made some changes to the proposal that are outlined for you in the latest memo from Dr. Vanderah. We find that the revised proposal fails to address many concerns that have been raised by the UGC and faculty senators.

Many have asked why a new pre-medical degree is needed at our university. This was an important point raised by the UGC. A large number of programs already serve this population. For example, 5814 College of Science students self-identify as "pre-health" and over 1,500 students are enrolled in the Physiology and Medical Sciences degree in the College of Medicine (most are pre-health).
Since the medical school acceptance rate is about 7\%, we question why the College of Medicine is proposing a new program for this purpose. The most recent changes to the proposal only serve to make it more similar to other programs on campus. We anticipate that the primary outcome of the program would be to lower the number of students in established programs.

We urge you to take these facts into consideration when you make your decision regarding this proposal. Below we have responded to Dr. Vanderah's most recent memo. Our response describes some of the issues that remain with the proposal.

1. I made changes to some of the required courses (added MCAT/Med School course requirements). I investigated 28 medical schools in the West to Midwest as well as the MCAT requirements on the Excel sheet [enclosed]. I also included the BS in Medicine courses and highlighted in yellow what may (or may not) be needed.
Our Response: The revised major does add requirements needed for medical school ( 9 required units and 10 units as options for major electives). However, the revised major would exceed 120 units and does not include any free electives, resulting in a very constrained 4 -year plan. The revised proposal states that the major is 120 units but required foreign language courses ( 8 units) have been deleted from the original 4 -year plan and are not accounted for them in the total units (as they are required to be even if a student "tests out"). The revised major also does not include the required 42 upper-division credits. Additionally, it appears that the mathematics strand is not properly mapped to the major.* Many students wanting to take this major will need to take introductory math classes before they will be able to take introductory chemistry, physics or statistics. Beginning students may need to take an additional 6-14 units of mathematics in order to satisfy this requirement. To account for this possibility,
other pre-health majors on campus provide space for free electives and a more flexible 4-year schedule. On top of this, to be competitive for professional school, students will need to participate in research and/or internships; there is not room in the proposed major for this type of activity. These facts would make it difficult (or impossible) for the average UArizona pre-health major to complete the proposed degree in 4 years, especially those arriving from under-resourced schools.
2. I worked intensely on looking up job qualifications using websites like Indeed.com, and investigated the US Bureau of Labor Statistics, etc. to find out what type of medical jobs require a BS/BS degree, qualifications, growth of these jobs and starting pay. I am continuing to build this as it will be useful for our students if the BS in Medicine is approved.
Our Response: It continues to be a concern what career paths students with the proposed degree will be prepared for. The major attempts to include multiple, diverse career paths, but unfortunately does not prepare students for many of the advertised careers. (1) Many careers advertised for the B.S. in Medicine (e.g. Dental Hygienist, Radiation Technologist, Physical Therapist Assistant) will require completion of an additional 2-year degree from an accredited program. Such programs require extensive technical coursework, typically through an Associate's degree (for example, a Radiation Technologist degree at Pima Community College https://www.pima.edu/academics-programs/degrees-certificates/health-sciences/radiologic-technology/radiologic-tech-aas/index.html). Because this accreditation and coursework are not part of the proposed major, we must assume that students would need to pursue BOTH a B.S. and an Associate's degree (total time of 6 years) for a career that typically requires only a 2-year degree. (2) After we objected that several listed careers require little or no formal training (e.g. Home Health Aides, Phlebotomist) these careers have been removed from the proposal. However, this left no careers in the category of "A BS in Medicine will allow students to directly enter the workforce including". To address this problem, proposers have now added new careers in this category (e.g. Health Care in Artificial Intelligence, Worldwide Healthcare Business Development, Health Care Sales Rep, etc.). There is no evidence that coursework has been adapted to meet the educational needs for these newly added careers. There is no indication that proposers have talked to other units (for example, the Department of Computer Science or the Eller College) who would presumably need to collaborate on such an effort.
3. I met with the majority of those who wrote letters of opposition to work on mitigating issues and in some cases came to resolution but in other cases, we were unable to come to a full agreement. For example, several faculty asked that we simply propose a minor (and not a BS degree) to see how well this would be accepted and offer "good working relationships with other programs". I have brought this idea to our team and administration and there was an overall vote of No - we would like to continue to pursue a BS in Medicine Program.
Our Response: Indeed, we did have a meeting with Dr. Vanderah in which several compromise solutions were discussed (see email below), but none of these suggestions were accepted by the College of Medicine. One of these suggestions was a Minor in Medicine. This would meet the goals of the proposed major - to allow students to interact with physicians and to provide them additional, specialized training for professional school. The minor would also avoid the problem of misleading students (especially international students) to assume that obtaining a "B.S. in Medicine" would prepare them to be a physician. Students could pursue the minor and obtain a B.S. degree through an existing program. This path would prepare students to enter science careers if they are not admitted to medical school (as most will not be given medical school admission rates). A Minor in Medicine would be an asset to the university and would promote collaboration between units for the benefit of students.
4. I recruited a medical (physician) faculty member from our team - Dr. Paul Gordon -to be a spokesperson(s) for the BS in Medicine program. Practicing physicians are better able to explain the differences and advantages that the BS in Medicine Program can offer. No response needed.
5. I requested changing the name of the program to Medical Science and this was voted down. I had Administration in the Provost's Office look into the Legalities of the CIP code and the name BS in Medicine as being a legal name for this program as well.
Our Response: The name of the proposed major has been raised by members of the Faculty Senate, members of the UGC, and others. It is unclear why the College of Medicine is unwilling to consider or discuss a name change. The name "B.S. in Medicine" has significant potential to mislead students. (1) International students may confuse the degree with different systems for preparing to practice medicine. This is of particular concern for UA Global students who start coursework abroad and intend to finish their degree in the US. It is common for institutions outside of the United States and Canada to award Bachelor's degrees in medicine-typically "Bachelor of Medicine" or "Bachelor of Medicine, Bachelor of Surgery" degrees-which are professional degrees conferred upon completion of a graduate-level medical program and considered equivalent to a Doctor of Medicine (M.D.) and/or Doctor of Osteopathic Medicine (D.O.) degree. (2) The title of the degree does not meet guidelines laid out by the US Department of Education and the NES under "Classification of Instructional Programs". Specifically, the revised proposal lists the code for "Health/Medical Preparatory Programs". A "Medicine" degree is a different code for "a program that prepares individuals for the independent professional practice of medicine...". The proposed Bachelor's-level program in Medicine does not confer a professional health or medical degree, nor will it prepare students to practice professional medicine independently upon graduation. (3) We are concerned that the degree name will be most likely to negatively impact the students who are the least able to make informed decisions about selecting a major upon arrival at university. First-generation and underrepresented minority students are very likely to arrive on campus with a strong interest in medicine, often viewing this as a way to give back to their community. These students are less likely to have parents or mentors who can guide them in selecting and navigating a major and would presumably be more likely to choose a major based on the name "medicine" without considering the specifics of the degree program. Given our concerns about the structure of the major, this seems like a particularly troublesome way to potentially mislead students.

Sincerely,


Molly S. Bolger
Associate Professor
Molecular and Cellular Biology
College of Science


Michael Worobey
Louise Foucar Marshall Professor and Head Ecology and Evolutionary Biology College of Science


Joyce Schroeder
Professor and Head
Molecular and Cellular Biology College of Science

* The math strand determines which math courses/credits apply toward the 120-units required for a degree. Pre-med/pre-health programs typically set the bar at S-Strand because it indicates the degree can be completed in 4 -years, assuming majors start at Calculus I (MATH 122A/B or 125); S-Strand also implies that math courses starting at Calculus I and beyond will count toward the 120-units of required coursework (though math courses prior to Calculus I will not count toward the 120 -units). So the MStrand used for the BS in Medicine degree is problematic (particularly for pre-med/pre-health students) because majors could end up needing anywhere from 6-14 units of math in addition to the 120 -units required.

From: Vanderah, Todd W - (vanderah) [vanderah@arizona.edu](mailto:vanderah@arizona.edu)
Sent: Wednesday, April 14, 2021 12:21 PM
To: Bolger, Molly S - (mbolger) [mbolger@arizona.edu](mailto:mbolger@arizona.edu); Schroeder, Joyce A - (joyces)
[joyces@arizona.edu](mailto:joyces@arizona.edu); Worobey, Michael - (worobey) [worobey@arizona.edu](mailto:worobey@arizona.edu)
Cc: Ghosh, Indraneel - (ghosh) [ghosh@arizona.edu](mailto:ghosh@arizona.edu); Hingle, Melanie D - (hinglem)
[hinglem@arizona.edu](mailto:hinglem@arizona.edu)
Subject: Re: BS in Medicine Discussion
Thanks Molly,
I agree and I will re-visit the idea of a Minor. I will discuss these suggestions with the Team and Leadership. I have also met with a few other faculty that had opposition to the proposal and have two more meetings next week. I am going to gather all the suggestions and concerns so that I can present to leadership and try and convince them that we need to work out a better solution.

Todd
Todd W. Vanderah
Professor and Head
Department of Pharmacology
Co-Director of the MD/PhD Program
Director of the Comprehensive Pain and Addiction Center
University of Arizona, COM

From: Bolger, Molly S - (mbolger) [mbolger@arizona.edu](mailto:mbolger@arizona.edu)
Sent: Wednesday, April 14, 2021 12:07 PM
To: Vanderah, Todd W - (vanderah) [vanderah@arizona.edu](mailto:vanderah@arizona.edu); Schroeder, Joyce A - (joyces)
[joyces@arizona.edu](mailto:joyces@arizona.edu); Worobey, Michael - (worobey) [worobey@arizona.edu](mailto:worobey@arizona.edu)
Cc: Ghosh, Indraneel - (ghosh) [ghosh@arizona.edu](mailto:ghosh@arizona.edu); Hingle, Melanie D - (hinglem)
[hinglem@arizona.edu](mailto:hinglem@arizona.edu)
Subject: BS in Medicine Discussion
Hi Todd,

Thanks again for a productive discussion today about the BS in Medicine Proposal. As promised, I have attached a copy of the suggestions we made.
Best,
Molly
Text from Attached Document:
Goals for the BS in Medicine seem to include:

1. Adding unique additional training for pre-med and other pre-health majors
2. Providing opportunities for those in less-well-paid health careers (for example respiratory therapist) to obtain a BS degree and possible career advancement.
3. Helping undergraduate students navigate between different options in health care.

As proposed, the BS in Medicine program does not meet these goals for students. In addition, the proposal creates unnecessary duplication of efforts and competition among university units.
In order to better meet the stated goals, we suggest that the COM do ALL of the following.

1. The College of Medicine offers a MINOR in Medicine. The focus would be on pre-medicine, predentistry, pre-physical therapy, pre-pharmacy, pre-optometrist offering value-added courses that the COM thinks will give UArizona the edge in preparation for medical careers. The COS (and other prehealth programs) will help funnel thousands of pre-health students to the minor. This would allow programs that currently prepare pre-health majors to continue doing their job of getting students prepared with the coursework, science knowledge and science skills needed for a medical career. 2. The College of Medicine offers a BS (or BA) in Healthcare (or similar name) that is targeted at those who want to advance within technical careers in health care (physical therapy assistant, respiratory therapist etc.). This major would be a collaboration with Pima Community College as a " $2+2$ ". This would be a 2-year pathway for students already trained with technical skills (and an Associate's Degree) to come to the university to obtain their BS degree. This would prevent the COM from doing all of the necessary work to create a system for training students (required for accreditation for careers like this). The COM would work with SBS and COS to include any existing courses where relevant.
2. The College of Medicine would not advertise careers for which no formal training is required (such as home health aid or massage therapist).
3. The College of Science and the College of Medicine would strengthen their collaboration around the UArizona Prehealth Initiative with the shared purpose of helping students navigate their way through careers in health care.

## Academic Calendar Guidelines Revision

| Title | Guidelines for the Academic Calendar |
| :--- | :--- |
| Current Link | https://academicadmin.arizona.edu/sites/default/files/faculty senate academic calendar guidelines spring 2017.pdf |

> Revision Side by Side
> Additions in Green - Deletions in Yellow

Existing Guidance
General:

- The nominal length of the semester is 15 weeks of classes plus one week of final examinations.
- There shall not be less than 44 days nor more than 46 days in the MWF sequence.
- There shall not be less than 29 days nor more than 31 days in the TTh sequence.
- Last teaching day in the semester - Wednesday.
- Finals - start on Friday and extend through the following Thursday, including the Saturday following the first Friday.

Fall Semester:

- Classes shall start on Monday.
- Holidays will be Labor Day, Veterans' Day, and Thanksgiving Recess (four days starting on Thanksgiving Day).
- Last day of finals shall be the last Thursday in December falling on or before 12/20.
- New Student Orientation Program (last session) - Thursday and Friday prior to classes starting Monday.
- Freshman Convocation - Friday prior to classes starting on Monday.


## Proposed Edit

## General:

- The nominal length of the semester is 15 weeks of classes plus one week of final examinations.
- There shall not be less than 44 days nor more than 46 days in the MWF sequence.
- There shall not be less than 29 days nor more than 31 days in the TTh sequence.
- Last teaching day in the semester - Wednesday.
- Finals - start on Friday and extend through the following Thursday, including the Saturday following the first Friday.
- All standard sessions from previous terms will end prior to the next term beginning.

Fall Semester:

- Classes shall-will start on Monday Wednesday.
- Holidays will be Labor Day, Veterans' Day, and Thanksgiving Recess (four days seven days starting the Monday of on Thanksgiving Week Day).
- Typically the last day of finals shall be the last Thursday in December falling on or before 12/20.


## Academic Calendar Guidelines Revision

## Existing Guidance

- Honors Convocation - Friday afternoon (3:30-5:00 p.m. - no classes 35 p.m.) immediately preceding Family Weekend.

Spring Semester:

- Classes will start on a Wednesday.
- Holidays shall be Martin Luther King Day (third Monday in January) and Spring Recess (9 days, Saturday to Sunday inclusive, the eighth full week of classes).
- Last Friday of finals shall be the day before commencement.
- Commencement shall be on the first Saturday in May falling on or after May 11.
- New Student Orientation Program (last session) - Monday and Tuesday prior to classes starting on Wednesday.

Summer/Winter Sessions:

- Summer Session needs 13 weeks from the last day of spring semester (three weeks for presession (15 days) and two five-week summer terms (23 days each).
- Winter Session needs 14 teaching days between Fall and Spring semesters.

Designated Ten University of Arizona Holidays:

- Independence Day - July 4th *
- Labor Day - first Monday in September
- Veterans' Day - November11th *
- Thanksgiving - fourth Thursday and Friday in November
- Christmas Holidays - December 25th plus one additional day
- New Years Day - January 1st *
- Martin Luther King Day - third Monday in January
- Memorial Day - last Monday in May
* According to State Statue the holiday is observed on the weekday it falls on except as follows:
- if the holiday falls on a Saturday it will be observed on Friday

Proposed Edit

- New Student Orientation Program (last session) - Thursday and Friday prior to classes starting Monday.
- Freshman Convocation - Friday prior to classes starting on Monday.
- New Student Registration (last sessions) - Various dates the week prior to classes beginning.
- New Student Orientation/Welcome - Monday and Tuesday prior to classes starting on Wednesday.
- Honors Convocation - Friday afternoon (3:30-5:00 p.m. - no classes 35 p.m.) immediately preceding Family Weekend.


## Spring Semester:

- Classes will start on a Wednesday.
- Holidays shall be Martin Luther King Day (third Monday in January) and Spring Recess (9 days, Saturday to Sunday inclusive, the eighth full week of classes)
- Last Friday Thursday of finals shall be the day before commencement.
- Typically Commencement shall be on the first Saturday-Friday in May falling on or after May 11.
- New Student Orientation Program-Registration (last session) -Monday-and Tuesday prior to classes starting on Wednesday.

Summer/Winter Sessions:

- Summer Session needs shall be 13 weeks from the last day of spring semester (three weeks for presession ( $1514 \mathrm{M}-\mathrm{F}$ days), and two fiveweek summer terms ( 23 M-F days each), and two six-week sessions (between 30-31 days M-F each).
- There will be no summer sessions that extend past the last day of the 13 week session.
- Winter Session needs shall be 14 teaching days between Fall and Spring semesters.

Designated Ten University of Arizona Holidays:

- Independence Day - July 4th *
- Labor Day - first Monday in September


## Academic Calendar Guidelines Revision

## Existing Guidance

- if the holiday falls on a Sunday it will be observed on Monday

Note: Class day totals do not include holidays, spring recess, reading day or final examinations.

## Proposed Edit

- Veterans' Day - November11th *
- Thanksgiving - fourth Thursday and Friday in November
- Christmas Holidays - December 25th plus one additional day
- New Years Day - January 1st *
- Martin Luther King Day - third Monday in January
- Memorial Day - last Monday in May
* According to State Statue the holiday is observed on the weekday it falls on except as follows:
- if the holiday falls on a Saturday it will be observed on Friday
- if the holiday falls on a Sunday it will be observed on Monday

Note: Class day totals do not include holidays, spring recess, reading days or final examinations.

Academic Calendar Guidelines Revision

## 2022

Spring 2022 | January 12, 2022 - May 12, 2022 | No Changes

| Summer 2022 \| May 16, 2022 - August 10, 2022 |  |  |  |  | Dates that are updated |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Previous Dates |  | New Dates |  | Count of Class Meetings - less Holidays \& Reading Days |  |  |  |  |  |  |  |
| Session | Begin | End | Begin | End | M | T | W | R | F | MWF Days | TR <br> Days | MW <br> Days |
| PRE | 5/16/2022 | 6/4/2022 | 5/16/2022 | 6/4/2022 | 2 | 3 | 3 | 3 | 3 | 8 | 6 | 5 |
| 13W | 5/16/2022 | 8/10/2022 | 5/16/2022 | 8/10/2022 | 11 | 13 | 13 | 12 | 12 | 36 | 25 | 24 |
| 10W | 6/6/2022 | 8/10/2022 | 6/6/2022 | 8/10/2022 | 9 | 10 | 10 | 9 | 9 | 28 | 19 | 19 |
| 6W1* | 5/16/2022 | 7/1/2022 | 5/16/2022 | 6/28/2022 | 6 | 7 | 6 | 6 | 6 | 18 | 13 | 12 |
| 6W2* | 7/4/2022 | 8/19/2022 | 6/29/2022 | 8/10/2022 | 5 | 6 | 7 | 6 | 6 | 18 | 12 | 12 |

No Revisions require $A B O R$ approval
Note: 5W, 7W, \& 8W sessions consolidated to 6Ws

| Fall 2 | Previous Dates |  | New Dates |  | Count of Class Meetings - less Holidays \& Reading Days |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Session | Begin | End | Begin | End | M | T | W | R | F | MWF <br> Days | $\begin{gathered} \hline \text { TR } \\ \text { Days } \end{gathered}$ | $\begin{aligned} & \text { MW } \\ & \text { Days } \end{aligned}$ |
| 1 | 8/22/2022 | 12/7/2022 | 8/17/2022 | 12/7/2022 | 14 | 15 | 16 | 15 | 14 | 44 | 30 | 30 |
| 5W1 | 8/22/2022 | 9/23/2022 | 8/17/2022 | 9/21/2022 | 4 | 5 | 6 | 5 | 5 | 15 | 10 | 10 |
| 5W2 | 9/26/2022 | 10/28/2022 | 9/22/2022 | 10/26/2022 | 5 | 5 | 5 | 5 | 5 | 15 | 10 | 10 |
| 5W3 | 10/31/2022 | 12/7/2022 | 10/27/2022 | 12/7/2022 | 5 | 5 | 5 | 5 | 4 | 14 | 10 | 10 |
| 7W1 | 8/22/2022 | 10/12/2022 | 8/17/2022 | 10/9/2022 | 6 | 7 | 8 | 8 | 8 | 22 | 15 | 14 |
| 7W2 | 10/13/2022 | 12/7/2022 | 10/10/2022 | 12/7/2022 | 8 | 8 | 8 | 7 | 6 | 22 | 15 | 16 |
| 8WA* | 8/29/2022 | 10/23/2022 | 8/22/2022 | 10/16/2022 | 7 | 8 | 8 | 8 | 8 | 23 | 16 | 15 |
| 8WB* | 10/24/2022 | 12/18/2022 | 10/17/2022 | 12/11/2022 | 8 | 8 | 8 | 7 | 6 | 22 | 15 | 16 |

*8W Sessions - no M-W Thanksgiving Break or
Reading Days

8/17/2022 term start date must be approved by ABOR

Winter 2022 | December 19, 2022 - January 10, 2023 | No Changes

## 2023

Spring 2023 | January 11, 2023 - May 11, 2023 |No Changes

| Summer 2023 \| May 15, 2023 - August 9, 2023 |  |  |  |  | Dates that are updated |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Previous Dates |  | New Dates |  | Count of Class Meetings - less Holidays \& Reading Days |  |  |  |  |  |  |  |
| Session | Begin | End | Begin | End | M | T | W | R | F | MWF <br> Days | $\begin{gathered} \hline \text { TR } \\ \text { Days } \end{gathered}$ | $\begin{aligned} & \hline \text { MW } \\ & \text { Days } \end{aligned}$ |
| PRE | 5/15/2023 | 6/3/2023 | 5/15/2023 | 6/3/2023 | 2 | 3 | 3 | 3 | 3 | 8 | 6 | 5 |
| 13W | 5/15/2023 | 8/9/2023 | 5/15/2023 | 8/9/2023 | 12 | 12 | 13 | 12 | 12 | 37 | 24 | 25 |
| 10W | 6/5/2023 | 8/9/2023 | 6/5/2023 | 8/9/2023 | 10 | 9 | 10 | 9 | 9 | 29 | 18 | 20 |
| 6W1* | 5/15/2023 | 6/30/2023 | 5/15/2023 | 6/27/2023 | 6 | 7 | 6 | 6 | 6 | 18 | 13 | 12 |
| 6W2* | 7/3/2023 | 8/18/2023 | 6/28/2023 | 8/9/2023 | 6 | 5 | 7 | 6 | 6 | 19 | 11 | 13 |

*Showing original dates for 7W1/7W2.
No Revisions require $A B O R$ approval
Note: 5W, 7W, \& 8W sessions consolidated to 6Ws

Fall 2023 | August 16, 2023 - December 14, 2023
Dates that are updated
Count of Class Meetings - less Holidays \&

|  |  |  |  |  | Count of Class Meetings - less Holidays \& |  |  |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Ression | Begin | End | Begin | End | $\mathbf{M}$ | $\mathbf{T}$ | $\mathbf{W}$ | $\mathbf{R}$ | $\mathbf{F}$ | MWF <br> Days | TR <br> Days | MW <br> Days |
| 1 | $8 / 21 / 2023$ | $12 / 6 / 2023$ | $8 / 16 / 2023$ | $12 / 6 / 2023$ | 14 | 15 | 16 | 15 | 14 | 44 | 30 | 30 |
| 5W1 | $8 / 21 / 2023$ | $9 / 22 / 2023$ | $8 / 16 / 2023$ | $9 / 20 / 2023$ | 4 | 5 | 6 | 5 | 5 | 15 | 10 | 10 |
| 5W2 | $9 / 25 / 2023$ | $10 / 27 / 2023$ | $9 / 21 / 2023$ | $10 / 25 / 2023$ | 5 | 5 | 5 | 5 | 5 | 15 | 10 | 10 |
| 5W3 | $10 / 30 / 2023$ | $12 / 6 / 2023$ | $10 / 26 / 2023$ | $12 / 6 / 2023$ | 5 | 5 | 5 | 5 | 4 | 14 | 10 | 10 |
| 7W1 | $8 / 21 / 2023$ | $10 / 11 / 2023$ | $8 / 16 / 2023$ | $10 / 8 / 2023$ | 6 | 7 | 8 | 8 | 8 | 22 | 15 | 14 |
| 7W2 | $10 / 12 / 2023$ | $12 / 6 / 2023$ | $10 / 9 / 2023$ | $12 / 6 / 2023$ | 8 | 8 | 8 | 7 | 6 | 22 | 15 | 16 |
| 8WA* | $8 / 28 / 2023$ | $10 / 22 / 2023$ | $8 / 21 / 2023$ | $10 / 15 / 2023$ | 7 | 8 | 8 | 8 | 8 | 23 | 16 | 15 |
| 8WB* | $10 / 23 / 2023$ | $12 / 17 / 2023$ | $10 / 16 / 2023$ | $12 / 10 / 2023$ | 8 | 8 | 8 | 7 | 7 | 23 | 15 | 16 |

*8W Sessions - no M-W Thanksgiving Break or
Reading Days

8/16/2023 term start date must be approved by ABOR

Winter 2023 | December 18, 2023 - January 9, 2024 | No Changes

## 2024

## Spring 2024 | January 10, 2024 - May 9, 2024 |No Changes*

*Term ends before standard 'Commencement shall be on the first Friday in May Falling on or after May 11'

Summer 2024 | May 13, 2024 - August 7, 2024


*Showing original dates for 7W1/7W2.

Note: 5W, 7W, \& 8W sessions consolidated to 6Ws

No Revisions require ABOR approval
Last Term Submitted to Faculty Senate \& ABOR

Fall 2024 | August 21, 2024 - December 19, 2024

|  |  |  |  | Count of Class Meetings - less Holidays \& Reading Days |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Session | Session Description | Begin | End | M | T | W | R | F | MWF <br> Days | $\begin{gathered} \text { TR } \\ \text { Days } \end{gathered}$ | $\begin{aligned} & \text { MW } \\ & \text { Days } \end{aligned}$ |
| 1 | Regular Academic Session | 8/21/2024 | 12/11/2024 | 13 | 15 | 16 | 15 | 15 | 44 | 30 | 29 |
| 5W1 | Five Week - First | 8/21/2024 | 9/25/2024 | 4 | 5 | 6 | 5 | 5 | 15 | 10 | 10 |
| 5W2 | Five Week - Second | 9/26/2024 | 10/30/2024 | 5 | 5 | 5 | 5 | 5 | 15 | 10 | 10 |
| 5W3 | Five Week - Third | 10/31/2024 | 12/11/2024 | 4 | 5 | 5 | 5 | 5 | 14 | 10 | 9 |
| 7W1 | Seven Week - First | 8/21/2024 | 10/13/2024 | 6 | 7 | 8 | 8 | 8 | 22 | 15 | 14 |
| 7W2 | Seven Week - Second | 10/14/2024 | 12/11/2024 | 7 | 8 | 8 | 7 | 7 | 22 | 15 | 15 |
| 8WA* | Fall 8 Week 1st | 8/26/2024 | 10/20/2024 | 7 | 8 | 8 | 8 | 8 | 23 | 16 | 15 |
| 8WB* | Fall 8 Week 2nd | 10/21/2024 | 12/15/2024 | 7 | 8 | 8 | 7 | 7 | 22 | 15 | 15 |

*8W Sessions - no M-W Thanksgiving Break or
Reading Days

First Term that needs full Review/Approval

Winter 2024 | December 23, 2024 - January 14, 2025

|  |  |  |  | Count of Class Meetings - less Holidays \& Reading Days |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Session | Session Description | Begin | End | M | T | W | R | F | MWF <br> Days | $\begin{gathered} \text { TR } \\ \text { Days } \end{gathered}$ | MW <br> Days |
| WIN | Winter Session | 12/23/2024 | 1/14/2025 | 4 | 3 | 1 | 3 | 3 | 8 | 6 | 5 |

## 2025

Spring 2025 | January 15, 2025 - May 15, 2025

|  |  |  |  |  |  |  |  | Day | s Holid | s \& | ading |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Session | Session Description | Begin | End | M | T | W | R | F | MWF <br> Days | $\begin{aligned} & \text { TR } \\ & \text { Days } \end{aligned}$ | MW <br> Days |
| 1 | Regular Academic Session | 1/15/2025 | 5/7/2025 | 14 | 15 | 16 | 15 | 15 | 45 | 30 | 30 |
| 5W1 | Five Week - First | 1/15/2025 | 2/19/2025 | 4 | 5 | 6 | 5 | 5 | 15 | 10 | 10 |
| 5W2 | Five Week - Second | 2/20/2025 | 4/2/2025 | 5 | 5 | 5 | 5 | 5 | 15 | 10 | 10 |
| 5W3 | Five Week - Third | 4/3/2025 | 5/7/2025 | 5 | 5 | 5 | 5 | 5 | 15 | 10 | 10 |
| 7W1 | Seven Week - First | 1/15/2025 | 3/7/2025 | 6 | 7 | 8 | 8 | 8 | 22 | 15 | 14 |
| 7W2 | Seven Week - Second | 3/17/2025 | 5/7/2025 | 8 | 8 | 8 | 7 | 7 | 23 | 15 | 16 |
| 8WC* | Spring 8 Week 1st | 1/13/2025 | 3/9/2025 | 7 | 8 | 8 | 8 | 8 | 23 | 16 | 15 |
| 8WD* | Spring 8 Week 2nd | 3/10/2025 | 5/4/2025 | 8 | 8 | 8 | 8 | 8 | 24 | 16 | 16 |

*8W Sessions - no Reading Days or Spring Break

## Summer 2025 |May 19, 2025 - August 13, 2025

|  |  |  |  | Count of Class Meetings - less Holidays \& Reading Days |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Session | Session Description | Begin | End | M | T | W | R | F | MWF <br> Days | $\begin{gathered} \text { TR } \\ \text { Days } \end{gathered}$ | MW <br> Days |
| PRE | Pre-session | 5/19/2025 | 6/7/2025 | 2 | 3 | 3 | 3 | 3 | 8 | 6 | 5 |
| 13W | 13 Week | 5/19/2025 | 8/13/2025 | 12 | 13 | 13 | 12 | 11 | 36 | 25 | 25 |
| 10W | 10 Week | 6/9/2025 | 8/13/2025 | 10 | 10 | 10 | 9 | 8 | 28 | 19 | 20 |
| 6W1 | Six Week - First | 5/19/2025 | 7/1/2025 | 6 | 7 | 6 | 6 | 6 | 18 | 13 | 12 |
| 6W2 | Six Week - Second | 7/2/2025 | 8/13/2025 | 6 | 6 | 7 | 6 | 5 | 18 | 12 | 13 |

Fall 2025 | August 20, 2025 - December 18, 2025

|  |  |  |  | Count of Class Meetings - less Holidays \& Reading Days |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Session | Session Description | Begin | End | M | T | W | R | F | MWF <br> Days | $\begin{gathered} \hline \text { TR } \\ \text { Days } \end{gathered}$ | $\begin{aligned} & \hline \text { MW } \\ & \text { Days } \end{aligned}$ |
| 1 | Regular Academic Session | 8/20/2025 | 12/10/2025 | 14 | 14 | 16 | 15 | 15 | 45 | 29 | 30 |
| 5W1 | Five Week - First | 8/20/2025 | 9/24/2025 | 4 | 5 | 6 | 5 | 5 | 15 | 10 | 10 |
| 5W2 | Five Week - Second | 9/25/2025 | 10/29/2025 | 5 | 5 | 5 | 5 | 5 | 15 | 10 | 10 |
| 5W3 | Five Week - Third | 10/30/2025 | 12/10/2025 | 5 | 4 | 5 | 5 | 5 | 15 | 9 | 10 |
| 7W1 | Seven Week - First | 8/20/2025 | 10/12/2025 | 6 | 7 | 8 | 8 | 8 | 22 | 15 | 14 |
| 7W2 | Seven Week - Second | 10/13/2025 | 12/10/2025 | 8 | 7 | 8 | 7 | 7 | 23 | 14 | 16 |
| 8WA* | Fall 8 Week 1st | 8/25/2025 | 10/19/2025 | 7 | 8 | 8 | 8 | 8 | 23 | 16 | 15 |
| 8WB* | Fall 8 Week 2nd | 10/20/2025 | 12/14/2025 | 8 | 7 | 8 | 7 | 7 | 23 | 14 | 16 |

*8W Sessions - no M-W Thanksgiving Break or
Reading Days
Winter 2025 | December 22, 2025 - January 13, 2026

|  |  |  |  | Count of Class Meetings - less Holidays \& Reading Days |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Session | Session Description | Begin | End | M | T | W | R | F | MWF <br> Days | $\begin{gathered} \text { TR } \\ \text { Days } \end{gathered}$ | MW <br> Days |
| WIN | Winter Session | 12/22/2025 | 1/13/2026 | 4 | 4 | 2 | 1 | 3 | 9 | 5 | 6 |

## 2026

## Spring 2026 | January 14, 2026 - May 14, 2026

|  |  |  |  | Count of Class Meetings - less Holidays \& Reading Days |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Session | Session Description | Begin | End | M | T | W | R | F | MWF <br> Days | $\begin{gathered} \text { TR } \\ \text { Days } \end{gathered}$ | MW Days |
| 1 | Regular Academic Session | 1/14/2026 | 5/6/2026 | 14 | 15 | 16 | 15 | 15 | 45 | 30 | 30 |
| 5W1 | Five Week - First | 1/14/2026 | 2/18/2026 | 4 | 5 | 6 | 5 | 5 | 15 | 10 | 10 |
| 5W2 | Five Week - Second | 2/19/2026 | 4/1/2026 | 5 | 5 | 5 | 5 | 5 | 15 | 10 | 10 |
| 5W3 | Five Week - Third | 4/2/2026 | 5/6/2026 | 5 | 5 | 5 | 5 | 5 | 15 | 10 | 10 |
| 7W1 | Seven Week - First | 1/14/2026 | 3/6/2026 | 6 | 7 | 8 | 8 | 8 | 22 | 15 | 14 |
| 7W2 | Seven Week - Second | 3/16/2026 | 5/6/2026 | 8 | 8 | 8 | 7 | 7 | 23 | 15 | 16 |
| 8WC* | Spring 8 Week 1st | 1/12/2026 | 3/8/2026 | 7 | 8 | 8 | 8 | 8 | 23 | 16 | 15 |
| 8WD* | Spring 8 Week 2nd | 3/9/2026 | 5/3/2026 | 8 | 8 | 8 | 8 | 8 | 24 | 16 | 16 |

*8W Sessions - no Reading Days or Spring Break

## Summer 2026 |May 18, 2026 - August 12, 2026

|  |  |  |  | Count of Class Meetings - less Holidays \& Reading Days |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Session | Session Description | Begin | End | M | T | W | R | F | MWF <br> Days | $\begin{gathered} \text { TR } \\ \text { Days } \end{gathered}$ | MW <br> Days |
| PRE | Pre-session | 5/18/2026 | 6/6/2026 | 2 | 3 | 3 | 3 | 3 | 8 | 6 | 5 |
| 13W | 13 Week | 5/18/2026 | 8/12/2026 | 12 | 13 | 13 | 12 | 11 | 36 | 25 | 25 |
| 10W | 10 Week | 6/8/2026 | 8/12/2026 | 10 | 10 | 10 | 9 | 8 | 28 | 19 | 20 |
| 6W1* | Six Week - First | 5/18/2026 | 6/30/2026 | 6 | 7 | 6 | 6 | 6 | 18 | 13 | 12 |
| 6W2* | Six Week - Second | 7/1/2026 | 8/12/2026 | 6 | 6 | 7 | 6 | 5 | 18 | 12 | 13 |

Fall 2026 | August 19, 2026 - December 17, 2026

|  |  |  |  | Days |  |  |  |  |  |  | eading |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Session | Session Description | Begin | End | M | T | W | R | F | MWF <br> Days | $\begin{gathered} \hline \text { TR } \\ \text { Days } \end{gathered}$ | MW <br> Days |
| 1 | Regular Academic Session | 8/19/2026 | 12/9/2026 | 14 | 15 | 15 | 15 | 15 | 44 | 30 | 29 |
| 5W1 | Five Week - First | 8/19/2026 | 9/23/2026 | 4 | 5 | 6 | 5 | 5 | 15 | 10 | 10 |
| 5W2 | Five Week - Second | 9/24/2026 | 10/28/2026 | 5 | 5 | 5 | 5 | 5 | 15 | 10 | 10 |
| 5W3 | Five Week - Third | 10/29/2026 | 12/9/2026 | 5 | 5 | 4 | 5 | 5 | 14 | 10 | 9 |
| 7W1 | Seven Week - First | 8/19/2026 | 10/11/2026 | 6 | 7 | 8 | 8 | 8 | 22 | 15 | 14 |
| 7W2 | Seven Week - Second | 10/12/2026 | 12/9/2026 | 8 | 8 | 7 | 7 | 7 | 22 | 15 | 15 |
| 8WA* | Fall 8 Week 1st | 8/24/2026 | 10/18/2026 | 7 | 8 | 8 | 8 | 8 | 23 | 16 | 15 |
| 8WB* | Fall 8 Week 2nd | 10/19/2026 | 12/13/2026 | 8 | 8 | 7 | 7 | 7 | 22 | 15 | 15 |

*8W Sessions - no Reading Days

Winter 2026 | December 21, 2026 - January 12, 2027

|  |  |  |  | Count of Class Meetings - less Holidays \& Reading Days |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Session | Session Description | Begin | End | M | T | w | R | F | MWF <br> Days | $\begin{gathered} \hline \text { TR } \\ \text { Days } \\ \hline \end{gathered}$ | $\begin{aligned} & \hline \text { MW } \\ & \text { Days } \\ & \hline \end{aligned}$ |
| WIN | Winter Session | 12/21/2026 | 1/12/2027 | 4 | 4 | 3 | 2 | 1 | 8 | 6 | 7 |

## 2027

Spring 2027 | January 13, 2027 - May 13,2027

|  |  |  |  | Count of Class Meetings - less Holidays \& Reading Days |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Session | Session Description | Begin | End | M | T | W | R | F | MWF <br> Days | TR <br> Days | MW <br> Days |
| 1 | Regular Academic Session | 1/13/2027 | 5/5/2027 | 14 | 15 | 16 | 15 | 15 | 45 | 30 | 30 |
| 5W1 | Five Week - First | 1/13/2027 | 2/17/2027 | 4 | 5 | 6 | 5 | 5 | 15 | 10 | 10 |
| 5W2 | Five Week - Second | 2/18/2027 | 3/31/2027 | 5 | 5 | 5 | 5 | 5 | 15 | 10 | 10 |
| 5W3 | Five Week - Third | 4/1/2027 | 5/5/2027 | 5 | 5 | 5 | 5 | 5 | 15 | 10 | 10 |
| 7W1 | Seven Week - First | 1/13/2027 | 3/5/2027 | 6 | 7 | 8 | 8 | 8 | 22 | 15 | 14 |
| 7W2 | Seven Week - Second | 3/15/2027 | 5/5/2027 | 8 | 8 | 8 | 7 | 7 | 23 | 15 | 16 |
| 8WC* | Spring 8 Week 1st | 1/11/2027 | 3/7/2027 | 7 | 8 | 8 | 8 | 8 | 23 | 16 | 15 |
| 8WD* | Spring 8 Week 2nd | 3/8/2027 | 5/2/2027 | 8 | 8 | 8 | 8 | 8 | 24 | 16 | 16 |

*8W Sessions - no Reading Days or Spring Break

Summer 2027 |May 17, 2027 - August 11, 2027

|  |  |  |  | Count of Class Meetings - less Holidays \& Reading Days |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Session | Session Description | Begin | End | M | T | W | R | F | MWF Days | TR <br> Days | MW <br> Days |
| PRE | Pre-session | 5/17/2027 | 6/5/2027 | 2 | 3 | 3 | 3 | 3 | 8 | 6 | 5 |
| 13W | 13 Week | 5/17/2027 | 8/11/2027 | 11 | 13 | 13 | 12 | 12 | 36 | 25 | 24 |
| 10W | 10 Week | 6/7/2027 | 8/11/2027 | 9 | 10 | 10 | 9 | 9 | 28 | 19 | 19 |
| 6W1* | Six Week - First | 5/17/2027 | 6/29/2027 | 6 | 7 | 6 | 6 | 6 | 18 | 13 | 12 |
| 6W2* | Six Week - Second | 6/30/2027 | 8/11/2027 | 5 | 6 | 7 | 6 | 6 | 18 | 12 | 12 |

Fall 2027 | August 18, 2027 - December 16, 2027

|  |  |  |  | Count of Class Meetings - less Holidays \& Reading Days |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Session | Session Description | Begin | End | M | T | W | R | F | MWF Days | TR <br> Days | MW <br> Days |
| 1 | Regular Academic Session | 8/18/2027 | 12/8/2027 | 14 | 15 | 16 | 14 | 15 | 45 | 29 | 30 |

AY 27-28 - Dates for Information and not approval

# OFFERING AN EXTENDED ORIENTATION PROGRAM FOR INCOMING MAIN CAMPUS STUDENTS 

BEGINNING IN FALL 2022

## WHY OFFER ADDITIONAL ORIENTATION PROGRAMMING?



TAT The UniVERSITY OF ARIZONA

## WHAT IS SENSE OF BELONGING?

Sense of belonging refers to students' perceived social support on campus, a feeling or sensation of connectedness, and the experience of mattering or feeling cared about, accepted, respected, valued by, and important to the campus community or others on campus such as faculty, staff, and peers. ${ }^{1}$


## WHY DO ARIZONA STUDENTS LEAVE?



## 65\%

of undergraduate and $\mathbf{6 8 \%}$ of graduate students felt as though they belong at the UA

## RETURN ON INVESTMENT

## Iowa State University

- Retention increase of 7-9\%
- Saw biggest gains in retention into $3^{\text {rd }}$ year

Kansas State University

- Participants retention was 31\% higher than non-participant
- Significant differences between first semester grade point average for students who participated


## University of Minnesota

- Students who attended program had statistically significant and higher sense of belonging, fall/spring cumulative grade point averages, and higher retention rates
- Students who attended were $28 \%$ more likely to return the following year


## Louisiana State University

- Students who participate are 30\% more likely to be retained to the second year than their peers that did not participate in the program


## SUCCESSFUL EXTENDED ORIENTATION PROGRAMS

Auburn
Clemson
University
Duke
University
Georgia Tech
University

Iowa State University

Miami
University

| Minnesota |
| :---: |
| State |
| University |

> University of
> Tennessee at Knoxville


## University of Colorado Boulder

> University of Kentucky

University of Washington

## FUNDING EXTENDED ORIENTATION

## Small increase in the Enrollment Fee

- Effective for Fall 2022 enrollees
- Pell eligible students can defer the Enrollment Fee until Fall aid disbursement


## Redistribution of current Enrollment Fees collected

- Programming traditionally paid for by departments would remain, i.e. Welcome Picnic


## NEXT STEPS

The Office of Orientation and New Student Services will lead the planning and implementation of this effort in conjunction with a committee of campus partners

A full plan will be developed throughout Summer and Fall 2021

Program launch will align with the new General Education curriculum

## UPDATED PROPOSAL: EXTENDED ORIENTATION PROGRAMMING BEGINNING IN FALL 2022

Beginning Fall 2022, Enrollment Management (EM) and partners propose offering an extension to new student orientation. This program will help new, main campus students acclimate to the University of Arizona and take place prior to the fall semester beginning. The programming will help students develop a sense of belong as part of the Wildcat Family and is intended to increase retention and completion. Institutions that offer such programs have seen an increase in first-to-second year retention.

To do this, we propose moving the first day of fall semester classes to a Wednesday and provide a structured transitional "extended orientation" (to be named) for new main campus students (and their families/ supporters). A Wednesday start will align fall and spring semesters as well and allow for two full days of connecting new students with "just in time" information for a successful start.

For Fall 2021, the Orientation and New Student Services team will implement a smaller-scale (virtual) version to welcome our new Wildcats within the current calendar.

## PREPARING FOR THIS CHANGE

## AFFORDABILITY

A two-day program will keep added expenses to a minimum for new students and their families. A small increase is expected in housing and meal costs which will also be reflected in the estimated cost of attendance used to determine eligibility for financial aid.

## PLANNING

The Office of Orientation and New Student Services in EM will lead the planning and implementation of this effort in conjunction with a committee of campus partners. A full plan will be developed throughout Summer/Fall 2021. Best practices and benchmarking have been done with student belonging, student success and retention as the focus. Launching this program in AY22-23 will also align with the new General Education curriculum. More information on similar programming offered can be reviewed at https://bit.ly/3dczVcl.

## BUDGET

To offer this new program all incoming, main campus students, will pay a slight increase in the Enrollment Fee of $\$ 25$. The increase was approved via ABOR in the April 2021 meeting and will be effective for Fall 2022 enrollees. Please note Pell eligible students are able to defer the Enrollment Fee.

SAMPLE PROGRAMMING (to be determined with campus partners and academic units)

- Small group connection opportunities and programming with student leaders
- Entire Incoming Class Programming
- New Student Convocation
- Interest Sessions
- Title IX Conversations \& Training
- Cultural Competency Training and Diversity, Equity and Inclusion Panels
- Financial Literacy/Education
- Class Photo
- Separate programming tracks for first-year vs. transfer students
- Parent/supporter programming


## Extended Orientation Topics \& Sessions:

- Academic Convocation (Presidential Welcome, Provost, College Deans)
- Campus Resource Tours
- Campus Safety Programming
- Campus Traditions
- Career Development and Student Engagement
- College/Department Programming (UA Clicks expanded)
- Cultural Competency Training / Title IX
- Dean of Students
- Financial literacy, including financial aid and scholarships
- Housing Programming/Relationship Building
- Start of School Celebration
- Tucson Community

CAMPUS PARTNERS (partial list on no particular order):

- Academic Colleges \& Departments
- Housing \& Residence Life
- Scholarships \& Financial Aid
- Student Unions / BookStores / Parking
- Campus Recreation
- Disability Resource Center
- Campus Health
- Student Success \& Retention Innovation
- A Center
- Cultural Centers/Resource Centers
- Campus Life (ASUA, Greek Life)
- Student Development \& Career Engagement
- Dean of Students
- Parent \& Family Programming
- Presidential Events
- Hispanic Serving Initiatives
- Native American Initiatives
- UAF / Alumni Association
- Research and Innovation
- Advising Resource Center
- Government \& Community Relations
- Off Campus Partners
- UA Libraries
- Office of the Registrar
- And many others...


## (1) Bylaws Change - Include the Vice President for Research as a member of Senate.

Rationale: There has been an interest in ensuring better ongoing communication between Research, Innovation, and Impact and the Faculty Senate. Formally including the Vice President as a member of Senate would ensure they are present and can answer questions and participate in discussions. They could also be asked to participate in providing monthly reports, as do the Provost and President. In order to retain the same number of administrative representatives to Senate, we suggest removing the at large vice presidential representative if we add this one.

Note: The text, below, also shows the ex officio administrators on Senate as nonvoting rather than voting members. This has been proposed as a change and is a separate item that will be voted on later on the ballot.

## ARTICLE VIII. The Faculty Senate

## Section 2. Membership

Ex officio non-voting members. The President of the University, the Provost, the Chief Research Officer at the University, and a representative of the Deans. Ex officio voting members: the Chair of the Faculty, the Vice Chair of the Faculty, the Secretary of the Faculty, the chair of the Strategic Planning and Budget Advisory Committee, the chair of the Undergraduate Council, the chair of the Graduate Council, and the chair of the Committee of Eleven When the chairs of any of these committees are not an already elected members of Faculty Senate, they shall be voting members of the Faculty Senate. If any of these committees have co-chairs, there shall only be one vote between them. In addition, one member shall represent the Vice Presidents, and one member shall represent the Deans.

## (2) Bylaws Change - Ensure Senate Standing Committees have access to relevant administrators, when necessary to support their work.

Rationale: Having timely access to representatives from administration has been essential for Senate Standing Committees in their work on policy. This change underscores the importance of having that timely access and sets shared expectations as to administrators' availability when called upon by committee chairs.

## Article VIII. Faculty Senate

## Section 4. Faculty Senate Standing Committees

Each Faculty Senate standing committee, except the Executive Committee, shall consist of seven General Faculty members, a majority of whom must be elected Faculty who are members of Senate. The standing committee members shall be appointed by the Vice Chair of the Faculty, after consultation with the Faculty Senate Executive Committee, from names suggested by the Nominating Committee or other members of the General Faculty. A postdoctoral scholar may also be appointed to each committee at the discretion of the Vice Chair. Student members of standing committees shall be nominated by the Associated Students of the University of Arizona
and by the Graduate and Professional Student Council. Members of standing committees shall serve one-year terms. As appropriate, representatives from administration (such as the Dean of Students, the Vice Provost for Faculty Affairs, etc.) may be asked to attend Senate Standing Committee meetings at the invitation of the committee chair. Members of standing committees shall serve one-year terms.

## (3) Bylaws Change - Provide flexibility for adding a postdoctoral scholar to Senate Standing Committees (other than Senate Executive Committee)

Rationale: For the past 3-4 years, we have piloted including a postdoctoral scholar on each of the Senate standing committees. This has been well received by the committee chairs and membership. We are suggesting we give the Vice Chair the option to appoint a postdoctoral scholar to these committees.

## Article VIII. Faculty Senate

## Section 4. Faculty Senate Standing Committees

Each Faculty Senate standing committee, except the Executive Committee, shall consist of seven General Faculty members, a majority of whom must be elected Faculty who are members of Senate. The standing committee members shall be appointed by the Vice Chair of the Faculty, after consultation with the Faculty Senate Executive Committee, from names suggested by the Nominating Committee or other members of the General Faculty. A postdoctoral scholar may also be appointed to each committee at the discretion of the Vice Chair. Student members of standing committees shall be nominated by the Associated Students of the University of Arizona and by the Graduate and Professional Student. Members of standing committees shall serve oneyear terms.
(4) Bylaws Change - Include the CIO or their designee as an ex officio, non-voting member of the Senate Executive Committee.

Rationale: We have piloted having representation from UITS on the Senate Executive Committee for a number of years and found it useful. We are suggesting we make this representation official in the Bylaws.

## Article VIII. Faculty Senate

## Section 4. Faculty Senate Standing Committees

## a. Executive Committee

The committee membership shall consist of the Chair of the Faculty, the Vice Chair of the Faculty, the Secretary of the Faculty, chairs of the Faculty Senate standing committees, chair of the

Committee of Eleven, chair of the Strategic Planning and Budget Advisory Committee (SPBAC), chair of the Undergraduate Council (UGC), chair of the Graduate Council (GC), ene member of the Appointed Professionals Advisory Council (APAC) two members of the UArizona Staff Council shall be appointed annually by the Chair of APAC, two members of the Senate elected at the regular May meeting of the Faculty Senate in alternate years from nominees whose names were submitted to the Faculty Center in time for distribution with the agenda for that meeting, the President of the University or their designee (non-voting), the Provost or their designee, (nonvoting), the Chief Information officer or their designee (non-voting), the President of ASUA or their designee, the President of GPSC or their designee, and the Parliamentarian who shall be nonvoting. The committee shall establish the agenda for each meeting of the Faculty Senate and shall receive reports from the officers, the chairs of the Senate standing committees, UGC, GC and SPBAC. The Vice Chair of the Faculty shall serve as chair of the committee.

## (5) VOTE on HOUSEKEEPING CHANGE

## Bylaws - Remove references to SAC and APAC and replace with UArizona Staff Council but retain the same number of representatives from both SAC and APAC.

Rationale: SAC and APAC no longer exist and have been replaced by the UArizona Staff Council. We are recommending we remove SAC and APAC where they are mentioned in the Bylaws, but keep the same level of representation (i.e., two members if both were represented on a shared governance body).

## (6) VOTE on HOUSEKEEPING CHANGE

Bylaws - Remove reference to "Point of View" Informal Mediation as a service that is offered by HR as an option in the grievance process.

Rationale: The "Point of View" informal mediation service is no longer formally offered by Human Resources. Human Resources can aid grievants in identifying point of view mediation support on campus, but the service no longer exists. The Bylaws will be amended to clarify this.

## ARTICLE VII. Grievance Policies and Procedures for Faculty Section 4. Informal Resolution Procedures.

"Point of View" - The University's Informal Mediation Program. The Point of View Informal Mediation, sponsored by Human Resources, provides neutral trained mediators from the University community.Human Resources can provide and/or assist with securing access to neutral trained mediators. Those who elect to use this process are provided an opportunity to share their uninterrupted point of view. The mediator does not decide who is right or wrong; instead, the mediator helps people understand the conflict and brainstorm options to solve it.

# (7) Bylaws Change - Include ex officio voting members from Senate on the Undergraduate and Graduate Councils, and on the University-Wide General Education Committee 


#### Abstract

Rationale: This addition is being suggested to ensure adequate representation to and from Senate in these governance groups' work. Currently, the only representation is through the Chairs of the Committees. Including Senators also ensures there is a baseline of elected shared governance representation on each group, since colleges are given significant leeway (including appointments) in selecting their own representatives.


## Article VI. University-wide Committees with Shared Governance Participation Sections 4, 5 \& 6

Two ex officio voting members from Faculty Senate. These members are appointed by the Vice Chair of the Faculty in consultation with the Chair and after nominations have been received from the Senate. Terms are for one year but are renewable.

## (8) Bylaws Change - Require that the Committee on Elections post vote totals following all General Faculty elections.

Rationale: We currently provide vote totals only when individuals request them directly from the Committee on Elections. There is an interest among many faculty in simply posting the vote totals along with the results for all to see.

## Article IV. Committee on Elections and Elections Procedures

## Section 2. Conduct of Elections

f. The committee shall notify the General Faculty of the results of the runoff election no later than April 25. Results for all General Faculty elections will include a list of any individuals elected and policies adopted, vote counts, as well as an and the overall participation rate for the election. Requests for vote counts in individual races may be made to the Committee on Elections.

## (9) VOTE on HOUSEKEEPING CHANGE

Bylaws - Reformat wording on Undergraduate Council and University-Wide General Education Committee to mirror format of Graduate Council

Rationale: The current formatting on the section on the membership of the Graduate Council reads more easily than that of the Undergraduate Council and University-Wide General Education Committee. We recommend we reformat those sections in a similar manner.

Article VI. University-wide Committees with Shared Governance Participation Sections 4 \& 5
(10) VOTE on HOUSEKEEPING CHANGE

Constitution - Remove references to the College Academic Administrators Council, or CAC, in the Constitution

Rationale: The College Academic Administrators Council, or CAC, no longer exists and has been split into two groups to more effectively deal with curricular matters. We recommend removing it from the Constitution. Because the two groups that have since been formed out of CAC are not shared governance bodies, we do not see a need to include them in the Constitution.

Article VII. University-wide Committees with Shared Governance Participation Sections 4 \& 6

## (11) VOTE on HOUSEKEEPING CHANGE

Bylaws - Replace references to University of Arizona South with The College of Applied Science and Technology.

Rationale: UA South, as an entity, no longer exists. It makes sense to replace the reference to it (which is in reference to UWGEC representation) with The College of Applied Science and Technology.

Article VI. University-wide Committees with Shared Governance Participation Section 5
(12) VOTE on Rescinding Bylaws Change Previously Approved by Senate (but not yet Voted on by the General Faculty) to Require All Faculty Representatives to Undergraduate Council and Graduate Council to be Either Elected or Appointed by an Elected Faculty Officer.

Rationale: After additional conversation with these committees and their Chairs (who strongly oppose the proposed change), we recommend rescinding this vote (which has not yet gone to a vote of the General Faculty, so there would be no actual change to the Bylaws as a result). Because these committees do an extraordinary amount of work requiring specific expertise, and also because not all colleges have mechanisms for electing representatives to these positions, it is important to allow for the current level of flexibility in empaneling these groups. Adding two elected Senators to each group (which is being recommended as a change to their membership) should ensure a baseline of campus-level shared governance representation.

# Article VI. University-wide Committees with Shared Governance Participation Sections 4 \& 6 

## (13) Bylaws Change - Removing voting rights for administrators with ex officio appointments on Faculty Senate

Rationale: There has been interest among Senators and Members of the General Faculty to remove voting rights from administrators who have ex officio appointments on Senate. This would include the Provost, the President, the administrative representative for the Vice Presidents (which will become the Chief Research Officer, if the vote on that change is approved) and the Deans' representative. While the individuals in these roles rarely vote in Senate, proponents of this change feel that extending voting rights to administrators on Senate is inappropriate on a shared governance body such as Senate.

## Article VIII. The Facutly Senate <br> \section*{Section 2. Membership}

The voting-members of the Faculty Senate shall be comprised of the following: Ex officio nonvoting members. The President of the University, the Provost, the Chief Research Officer at the University, and a representative of the Deans. Ex officio voting members: the Chair of the Faculty, the Vice Chair of the Faculty, the Secretary of the Faculty, the chair of the Strategic Planning and Budget Advisory Committee, the chair of the Undergraduate Council, the chair of the Graduate Council, and the chair of the Committee of Eleven When the chairs of any of these committees are not an already elected members of Faculty Senate, they shall be voting members of the Faculty Senate. If any of these committees have co-chairs, there shall only be one vote between them. In addition, one member shall represent the Vice Presidents, and one member shall represent the Deans. Elected voting members: Elected members of the Faculty Senate will hold office for two years, beginning on June 1 of the year in which they are elected, in accordance with the following: [...] Seven students: four students selected annually by the Associated Students of the University of Arizona and three students, selected annually by the Graduate and Professional Student Council in whatever manner those bodies decide. All will hold voting membership and be afforded the full privileges thereof.

| Policy Title | University Handbook for Appointed Personnel (Definitions) |  |  |
| :---: | :---: | :---: | :---: |
| Policy Link | https://policy.arizona.edu/uhap-definitions |  |  |
| Rationale for Update | As part of the Career Track Title Harmonization Project, the current definition for Professors of Practice is being revised to provide clarity around the qualifications and responsibility of the series. |  |  |
| Effective Term and Implementation Considerations | The changes to the definition of Professors of Practice will become effective when published. Implementation will be managed by Heads/Directors who will discuss with faculty in their unit whose duties aligns with a Professor of Practice series title and make appropriate revisions to the faculty member's appointment title as part of the ongoing contract process. |  |  |
| Contact Person for Questions | Administration Senior Leadership Team Policy Sponsor: <br> Andrea Romero, Vice-Provost for Faculty Affairs <br> Shared Governance Sponsor: <br> Faculty Senate ad hoc Committee on Career Track Faculty: <br> Bill Neumann / Kasi Kiehlbaugh (co-chairs) |  |  |
| Notifications for Comment and Content Review of Proposed Policy Revisions by Shared Governance and University Leadership | SPBAC | Report: 3 Mar 2021 | Status: Completed |
|  | APPC | Report: 11 Feb 2021 <br> Report: 22 Apr 2021 | Status: Completed <br> Status: Completed |
|  | Deans Council | Report: 24 Feb 2021 <br> Report: 2 Apr 2021 | Status: Completed <br> Status: Completed |
|  | HeadsUp Steering Committee | Report: 1 Apr 2021 | Status: Completed |
|  | HR Consultants | Report: 8 Apr 2021 | Status: Completed |
|  | Faculty Affairs Network | Report: 7 Apr 2021 | Status: Completed |
|  | CABO | Report: 14 Apr 2021 | Status: Completed |
|  | Faculty Senate | Informational Item: 1 Mar 2021 Informational Item: 4 Apr 2021 <br> Action Item: 3 May 2021 | Status: Completed <br> Status: Completed <br> Status: Pending |

## Policy Revision Side by Side

Additions in Green - Deletions in Yellow - Reordered in Blue

## Existing UHAP Definition

Professors of Practice means career-track, visiting, or adjunct faculty employees whose Notice of Appointment incorporates the ABOR Conditions of Faculty Service (ABOR-PM 6-201, et seq.) who have established themselves by expertise, achievements, and reputation over a sustained period of time to be distinguished professionals in an area of practice or discipline.

## Proposed UHAP Definition

Professors of Practice means career-track, visiting, or adjunct faculty employees whose Notice of Appointment incorporates the ABOR Conditions of Faculty Service (ABOR-PM 6-201, et seq.) who have established themselves to be qualified professionals in an area of practice or discipline either by expertise, achievements, and reputation over a sustained period of time and/or by scholarly qualifications. The primary responsibilities of this position include the practice of teaching and mentoring students in a manner that advances the educational mission of the University in a significant or substantial way and may also include (1) service, (2) land-grant outreach, and/or (3) research, creative work, and scholarship.


[^0]:    **Faculty Senate drop-in Office Hours will go on hiatus for the summer beginning the week of May 17 and return again this fall. **

[^1]:    ${ }^{1}$ Hund, K., La Porta, D., Fabregas, T.P., Laing, T., and Drexhage, J., 2020, Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition, The World Bank Group, ClimateSmart Mining Facility (http://pubdocs.worldbank.org/en/961711588875536384/Minerals-for-Climate-Action-The-Mineral-Intensity-of-the-Clean-Energy-Transition.pdf)
    ${ }^{2}$ Arizona Geological Survey, Arizona Geology e-Magazine, 2020, USGS Mineral Commodities Summary 20020: Arizona's piece of the pie (https://blog.azgs.arizona.edu/blog/2020-02/usgs-mineral-commodities-summary-2020-arizonas-piece-pie)
    ${ }^{3}$ The World Bank Group, Climate-Smart Mining, 2019, Climate-Smart Mining: Minerals for Climate Action (https://www.worldbank.org/en/news/infographic/2019/02/26/climate-smartmining)

[^2]:    ${ }^{10}$ Casey, J.P., 2021, In numbers: how mining came to be Australia's most profitable sector, Mining Technology, Analysis (https://www.mining-technology.com/features/in-numbers-how-mining-came-to-be-australias-most-profitable-sector/)
    ${ }^{11}$ Kecojevic, V., 2021, Student and Faculty Numbers in Mining Engineering Programs, Society of Mining Professors and Society for Mining, Metallurgy, and Exploration.
    ${ }^{12}$ UArizona mining perception study surveys were conducted face-to-face using tablet computers November-December 2019. Sample size $=344$, confidence level of 95 percent, and margin of error of $+/-5.25$ percent.
    ${ }^{13}$ UArizona freshmen engineering student surveys were conducted online (a) September 14-October 26, 2020. Sample size $=363$, confidence level of 95 percent, and margin of error of $+/-2.7$ percent. (b) November 30-December 6, 2020. Sample size $=367$, confidence level of 95 percent and margin of error of $+/-2.7$ percent.

